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SAJOUS'S

ANALYTIC CYCLOPEDIA
OF
PRACTICAL MEDICINE

BY
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WITH THE ACTIVE CO-OPERATION OF OVER
ONE HUNDRED ASSOCIATE EDITORS

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VOLUME NINE
INDEX-SUPPLEMENT

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FOREWORD

In order to apprehend clearly the purpose of the present volume, and the range of its usefulness, it is important to bear in mind that the inserts in the index matter are intended to portray what may eventually prove to be valuable additions to our knowledge, but too recent to have been finally subjected to the crucial test that time alone affords. The eight volumes may thus be said to supply, so to say, the orthodox conception of the whole practical field from A to Z, while the ninth volume (the present Index-Supplement) contains, besides an Index to the literature in the eight volumes, all recent contributions to our knowledge that have been thought by the editor to be worthy of study and trial. The plan of inserting this *sub judice* literature in the index matter—probably the first time that this has been done—was thought by the editor to afford what the hard pressed physician most urgently needs: *instant information,* orthodox and recent, of a practical nature.

A striking feature of the inserted matter is the relative paucity of new material upon familiar subjects, while subjects bearing directly and indirectly upon military practice, which have recently captivated the bulk of attention, are extremely numerous. Indeed, so great is the amount of matter of this class incorporated in the Index-Supplement that it may be said to constitute virtually a new work upon military subjects—broader, in respect to the field reviewed, than any at present available. Prospective members of the Medical Reserve Corps of the Army and Navy, as well as subscribers remaining in civil practice, will thus be materially aided.

It will be noted that the inserted matter becomes gradually less as the end of the volume is approached. This is due to two facts: (1) the presence of many war and other live subjects under captions beginning with the first letters of the alphabet (abdomen, adrenals, amputations, brain, chest, gangrene, etc.), and (2) the comparatively recent appearance of the last volumes of the series, which precluded, owing to the short time elapsed, any great accumulation of new practical matter.

The Index-Supplement will also be found to contain various articles that were introduced at the request of subscribers owing to their growing importance to the practicing physician, even though belonging to auxiliary fields—that of medical jurisprudence in the case of Occupational Diseases, for example—rather than to a work on practice.

The presence in the Index-Supplement of virtually the whole progressive literature of 1916, and of the first half of 1917, including all the new sterilizing methods, attests to the thoroughness with which recent literature has been fathomed for new and useful data.

THE EDITOR.

SAJOUS'S
ANALYTIC CYCLOPEDIA *of* PRACTICAL MEDICINE

INDEX-SUPPLEMENT

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Abderhalden test, v. 389; viii. 328

A critical analysis of the published evidence concerning the Abderhalden reaction, led Wallis (Quarterly Jour. of Med. Sept., 1916) to conclude that it was of the greatest value, elucidating as it did obscure features of immunity, the cell proper and its proteins, colloid chemistry and ferment action. In its application to the diagnosis of pregnancy, disorders of the ductless glands, dementia præcox and various infectious diseases, Abderhalden's principles fail to correspond with experimental data, but this only indicates that explanations of the phenomena witnessed must be sought. Izabolinsky (Russky Vratch, Vol. xv, No. 34, 1916) reached very similar conclusions in respect to infectious diseases after an experimental study.

The recent applications of the Abderhalden reaction are reviewed under the headings of the various conditions in which it has been employed.

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Acidosis and *Acetonemia.*—A leading feature of modern surgical practice is the attention paid to acidosis, a question reviewed in full in this Index (page 34) under that heading. Our Associate Editor, Robert T. Morris (Amer. Med., Nov., 1916) recalling that it may be due to an excess of ketone substances, acetone, diacetic, and oxybutyric acids (acetonemia, *q.v.*) accompanied in some cases by increased ammonia elimination, urges the importance of laboratory estimation of the patient's condition in this respect, prior to operation. Referring to Crile's demonstration that emotion led to temporary acidosis, and also to the etiological influence of such conditions as eye-strain, nasal hypertrophia, hemorrhoids, etc., he urges that all such be carefully sought, acid removed, in order to protect the patient as much as possible against complications. A. C. Burnham (Am. Med., Nov., 1916) writing much in the same vein, explains that the expenditure of muscular and energy before, during, and after operation entails a loss of energy, and a deficiency of glycogen, which carbohydrate starvation only serves to aggravate, and which manifests itself by acidosis, with *dyspnœa, tachycardia* and *acetone breath* as main phenomena. When acetone or diacetic acid are found in the urine in such cases, active treatment is indicated. Following Bainbridge's routine preoperative treatment he administers a **purgative** and for several days **milk sugar** and also **sodium bicarbonate** by **mouth** and **rectum**, to reduce the acidity of the urine to normal limits. In marked acidosis, large colonic irrigations of the same salt 6 to 10 quarts—liters—of a solution, 1 drachm—4 Gms.—to the pint—500 c.c) are given daily, for the same purpose. Graham (N. Y. Med. Jour., (Feb. 13, 1915) advocates a **farinaceous diet**, with **water ad libitum** as beverage, before operation.

Preoperative Shock.—Summarizing their results in a large number of abdominal gunshot wounds, Lockwood, Kennedy, Macfie, and Charles (Brit. Med. Jour., Mar. 10, 1917), besides emphasizing the importance of early operation, state that the prognosis is materially improved if **an hour or two is allowed for resuscitation prior to operation**, during which **saline solution** is given subcutaneously or by vein, **warmth** applied, an opiate injected, and **camphor in oil** given subcutaneously if a stimulant is required. Prior to operation it is well to give **omnopon** and **scopolamine.** The best anesthetic was found to be warm **ether and oxygen.**

general operative technique, i. 24

Position.—In 104 drainage appendix cases R. Hill (Trans. West. Surg. Assoc., Dec., 1916) compared the Fowler prone and lateral positions and obtained the following results: 1. In 15 cases treated in the lateral position there were no deaths. 2. In 42 cases treated in the prone position there were but 2 deaths. 3. In the 47 cases treated in the Fowler position there were 5 deaths. All cases received the same after-treatment. The author concludes that the posture contributes materially to his recovery, and that the prone and lateral positions are much superior to the Fowler.

Incision.—The **transverse incision** in the upper abdomen is strongly advocated by Moschowitz (Annals of Surg., Sept., 1916) to obviate the great difficulty in closing an upper abdominal wound often encountered in obese patients, and the resulting weak scar and subsequent hernia. It avoids cutting the nerve supply of the rectus muscles and prevents hernia, while affording a wide operative field. Moreover, it is easily closed.

Sponges.—**Sheet rubber** was found superior to gauze sponges in abdominal operations by J. W. Keefe (Jour. Amer. Med. Assoc., Aug. 19, 1916). He urges the discarding of gauze sponges and the substitution of rubber sheeting or rolls, because it eliminates the danger of leaving a sponge in the abdomen and the local acapnia due to contact of the moist sponge, and the resulting shock, a condition demonstrated by Henderson. Moreover, rubber sponges eliminate the tendency to form adhesions, so easily induced by the use of gauze, a very important point.

Sutures.—C. S. White (Surg., Gynec. and Obstet., Mar., 1917) recommends a continuous **vertical mattress suture** he has devised using fine chromic catgut or fine silk or linen and a needle of small diameter, straight or curved. A knot being tied at the long end, a deep suture is taken which includes the entire thickness of the skin, from one side of the incision to the opposite, about 1 cm. from the edge. The needle is then reversed in the holder, and the suture passed obliquely toward the other side, or the side on which the suture was started, barely engaging the edges of the wound. The needle is then introduced a trifle lower, on the side on which it originally entered, 1 cm. from the edge, and the first deep suture is repeated. These deep and superficial sutures are continued until the wound is closed.

In a soldier in whom a bullet had slit the diaphragm 4 inches without injuring any organ in its passage through the seventh left interspace, O. Ortali (Gaz. degli Osped., Mar. 25, 1917) resected a rib to obtain access to the diaphragm, easily reduced the omentum and colon, and sutured the diaphragm. Prompt recovery ensued.

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The dangers attending general and even spinal anesthesia in greatly weakened or moribund patients are being increasingly recognized, and corresponding attention is paid to local anesthetic methods. Lennander pointed out that, in general, anesthesia of the abdominal wall and parietal peritoneum is alone necessary to permit of intra-abdominal surgery, and upon this basis the indications of local anesthesia have been gradually extended in this field. J. H. Jacobson (Jour. Mich. State Med. Soc., xv, 57, 1916) maintains even that no operation under general anesthesia should be performed on an adult which can equally well be done under local anesthesia, urging the greater safety of the local procedure. He blocks off the line of incision by completely surrounding the area with a barrier of 0.5 per cent. **novocaine** solution to which 3 to 5 drops of 1: 1000 **adrenalin** solution per ounce have been added. The peritoneal cavity having been entered, the patient makes no complaint, unless tugging and pulling on the viscera are indulged in. Local anesthesia is particularly indicated in the presence of alcoholism, nephritis, myocarditis, and acute myocarditis, but in the experience of Jacobson and others, is well suited for such operations as suprapubic cystostomy, gastrostomy, enterostomy, cholecystostomy in debilitated patients with gall-bladder empyema or severe obstructive jaundice, appendectomy in tuberculous patients, all hernia operations, and operations for typhoid perforation. Vomiting seldom follows such anesthesia, and food can be taken shortly after the operation. Braun (Zentr. f. Chir., 1513, 1913), an eminent pioneer in local anesthesia, infiltrates abdominal tissues with **novocaine** and **adrenalin** dissolved in suitable percentages in a solution consisting of **potassium sulphate**, 4 parts; **sodium chloride**, 7 parts, and distilled water, enough to make 1000 parts. The potassium sulphate has been shown by Kochmann and Hoffmann to enhance the anesthetic action of novocaine, rendering a pronounced reduction in the percentage of the latter used feasible.

The idea of **blocking** the thoracic and lumbar **nerves** at their points of exit from the vertebral column, first suggested by Selheim in 1906 and improved by Kappis in 1911, is a distinct advance. E. O. Jones (Northwest Med., xv, 223, 1916) describes 10 cases in which the method has been used for abdominal operations. In 9 the anesthesia was entirely satisfactory, in 1 only partially so. The author concludes that the method is not a universal substitute for general anesthesia. When the latter is contraindicated for any reason this method can be used with satisfaction in most cases. It is perfectly safe so long as the strength of the **novocaine** solution does not exceed 1 per cent.

R. E. Farr (Trans. of Amer. Med. Assoc.; Med. Rec., June 16, 1917) concludes that where dissatisfaction with local anesthesia is due to the fact that the anesthesia had not been given in the proper doses, the technique and apparatus had been faulty. He uses **novocaine**, from 1 to 1.5 per cent., and on occasions as much as 40 ounces (1200 c.c.) anesthetizing to a depth of 3 inches into the abdominal and surrounding tissues before commencing operation. When the first incision is made the patient is thoroughly anesthetized. A nervous patient sometimes receives a narcotic beforehand. When the inflammation is great, after reaching the seat of operation he gives **nitrous oxide-oxygen**, but only for a minute, finishing the operation under the local anesthesia.

F. Nassau has used local anesthesia for some time, and found it most satisfactory. It causes less nausea and hastens convalescence.

Exceptions to the rule that parietal anesthesia is alone necessary for abdominal operations are the lesser omentum, the cystic and common bile-ducts, the portal vessels, the renal capsules, and the ureters, all of which are sensitive (also the pelvic and diaphragmatic peritoneal surfaces). To overcome this deficiency in the ordinary type of abdominal local anesthesia L. Adam (Deut. Zeit. f. Chir., Mar., 1915) has brought into use **paravertebral anesthesia**, in which certain of the rami communicantes on one or both sides of the spinal column are blocked by injections of 3 c.c. (48 minims) of a 1 per cent. solution of **novocaine** in 0.4 per cent. **potassium sulphate** solution. To anesthetize the entire abdomen it is necessary to block the nerves from the fifth dorsal to the third lumbar vertebræ on both sides; 3 injections can, however, be made with but one introduction of the needle. As much as 120 to 160 c.c. (4 to 5 ounces) of the novocaine solution have been used. The method has not as yet received wide recognition. Another procedure intended to facilitate abdominal local anesthesia is that introduced by Fowelin (Zeit. f. Chir., 342, 1913), who, in removing the appendix in chronic appendicitis, supplements the usual infiltration of the abdonimal wall with injections of 1 per cent. **novocaine-adrenalin** solution behind the peritoneum over the inner aspect of the ilium in the cecal region, thus obviating the pain due to delivery of the appendix from the abdominal wound. These supplementary injections are made from a point within the anterior superior iliac spine.

Preliminary injections of **morphine and scopolamine** are very useful, and often practically indispensable in extensive operations under local anesthesia.

Our associate editor, W. Wayne Babcock recommends a 1 per cent. **novocaine** solution for the skin incision and a 0.25 per cent. solution for the deeper tissues.

postoperative complications, i. 11

The *leaving of objects behind* in the peritoneal cavity after abdominal operations has been estimated by Huprecht to occur as often as in from 0.5 to 1 per cent. of all operations. Various devices have of late been resorted to to eliminate this danger. Thus, P. E. Truesdale (Jour. Amer. Med. Assoc., Jan. 17, 1914) has securely sewed to the end of each gauze sponge a **tape** 8 or 10 inches long, to which the nurse ties, before use, a numbered check the size of a silver dollar. Toward the end of the operation the sponges are arranged consecutively on a separate table and any missing one easily detected. Kubinyi (Zentr. f. Gynäk., June, 1914) has **long tapes** passed through holes in a single metallic ring, while E. O. Kane (Amer. Med., Jan., 1916) has all **sponges stamped** at one corner with a metal button, which, in case of doubt, after the operation, can be detected in the abdomen with the fluoroscope. J. W. Keefe (Med. Rec., July 8, 1916) turns the difficulty by **dispensing with sponges** and using a single band of sheet rubber 8 inches wide and 18 feet long, employed also for other reasons.

Maylard (Lancet, Feb. 28, 1914) reports an interesting case in which a long strip of iodoform gauze draining the ampulla of Vater was left in by mistake, caused trouble two weeks later, and was removed from the jejunum, into which it had ulcerated, at a second operation.

postoperative treatment, i. 8

Bonnot (Jour. Amer. Med. Assoc., Jan. 9, 1915) recommends the giving of 10 grains (0.6 Gm.) of **quinine hydrochloride** by rectum every six hours as lessening postoperative nausea, thirst, backache, and gas pains. Lockwood, Kennedy, Macfie and Charles (Brit. Med. Jour., Mar. 10, 1917), who base their conclusions on 356 operated abdominal penetrating wounds, **camphor in oil** is the best cardiac stimulant; **pituitrin** intramuscularly in half ampoule doses aids peristalsis and **eserine** is also often of value for this purpose. Two hundred Gms. (6⅔ ounces) of saline, with or without 30 Gms. (1 ounce) of **brandy**, should be given by rectum every 3 hours as a routine in all cases and continued for 2 to 3 days. Small sips of brandy or champagne, or ½

Gm. (8 minims) of **tincture of iodine** in 4 Gm. (1 fluidram) of water usually controls hiccoughs. With these measures nearly 50 per cent. of the patients operated upon recovered.

Regarding **laxative enemas** to be used, when necessary, after abdominal operations, Winslow Anderson (Pac. Med. Jour., Sept., 1916) points out the necessity of avoiding soap, and mentions as suitable enemas the following: (1) **Magnesium sulphate,** 2 ounces (60 Gm.), in water at 102° F. (38.3° C.), 1 pint (500 c.c.). (2) **Glycerin,** 2 ounces, in water at 102° F., 1 pint. (3) **Castor oil,** 2 ounces, in acacia emulsion (½ ounce—15 Gm.—of acacia to the pint of water). (4) **Oxgall,** 20 grains (1.3 Gm.), and glycerin, 1 ounce (30 c.c.), in starch-water, 1 pint (500 c.c.). T. A. Black (Med. Rec., Apr. 1, 1916), in postoperative ileus and intestinal paresis, uses an enema of 1 dram (4 c.c.) of stronger **ammonia-water** in 1 pint of water, the effect of which is greatly enhanced by a hypodermic injection of **pituitrin,** 16 minims (1 c.c.), half an hour previously.

A. Weeks (Jour. Amer. Med. Assoc., 1022, 1916), regarding **saline enteroclysis** by the Murphy method after operations, lays stress on limiting the flow constantly to that amount of fluid which is being absorbed at the time, to avoid bowel distress. He interposes in the dripping apparatus a funnel, which is hung on a level with the patient's abdomen. Trout (Surg., Gyn. and Obst., May, 1913) protests against the use of saline solution by rectum, having found a transient albuminuria to result from this procedure in a large series of cases. **Plain water** should be given **by rectum** instead. Comparative tests showed that one-third more fluid is thus absorbed, and that less water is required by the mouth.

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Abdominal contusions, i. 120.

Recent experience has served chiefly to emphasize the great variety of the injuries produced in abdominal contusion. Thus, Stierlin (Beitr. z. Klin. Chir., lxxxviii, No. 1, 1914) has presented a study of 81 recorded cases of traumatic *separation of the abdominal skin* from the fascia, a condition rarely recognized until a lymph collection has formed in the affected area, producing a local bulging which shows fluctuation and may subside or change position upon movement of the patient. Saalman (Deut. med. Woch., May 28, 1914), and Sand (Hospitalstid., Aug. 28, 1914), write concerning *rupture of the mesentery* as an only result of abdominal trauma. Saalman's patient, showing signs of internal hemorrhage, with vomiting and retention of feces and flatus, recovered after operation under local anesthesia. Certain cases regarded as lumbago following blunt violence to the abdomen are actually instances of mesenteric rupture, according to this author. Sand deems it impossible to make the diagnosis before operation, and advises **bowel resection** at the operation in case of doubt. He quotes Prutz's compilation of 44 cases, showing a mortality of 38 per cent. in the operated cases and 100 per cent. in the remainder.

In reporting a personal case of *retroperitoneal rupture of the duodenum* in which the points of interest were slight general and local reaction from the resulting abscess, due to the relative sterility of the duodenal contents, and also a point of tenderness beneath the twelfth rib, R. T. Miller (Annals of Surg., lxiv, 550, 1916) reviews a series of 22 cases. The injury is peculiar to the active working male, and is always due to trauma. In the 22 cases, 82 per cent. were situated in the second or third portions of the duodenum, and 15 showed retroperitoneal extravasations at operation. This is always found either in the root of the transverse mesocolon, in the root of the mesentery of the small bowel, or involving, in addition, the intervening retroperitoneal space, and is usually of rapid formation. The content is a bloody, bile-stained fluid mixed with gas that soon becomes purulent. The peritoneal cavity is clean or at best contains a very small amount of free blood-stained fluid, probably from a minute injury to some viscus. Peritonitis is undoubtedly delayed for some time by the intact peritoneum, but ultimately occurs. There may appear a fixed tumor in the upper right quadrant, but this was only noted in 2 cases. Of the 22 cases, 20 were operated on and but 3 recovered. No case survived when operation was postponed longer than 24 hours.

Lang (Deut. Zeit. f. Chir., cxx, 76, 1912) writes concerning the hemorrhages due to venous back pressure in *traumatic compression of the trunk;* skin ecchymoses in the region of the tributaries of the common facial vein are held to be almost constant in these cases. In the European war, nearby *shell explosions* have been found capable of causing hemorrhage in various internal organs, *e.g.,* the stomach, bladder, and lungs, without external evidence of injury; P. Ravaut (Presse méd., Apr. 8, 1915) has reported cases of this type.

Diagnosis, i. 107.—In a series of 30 cases of *traumatic rupture of abdominal viscera* seen by A. Rendle Short, the well-known British surgeon (Lancet, Sept. 16, 1911), the *temperature* of the patient proved of diagnostic value, being subnormal in the majority of instances. Abdominal pain and rigidity were almost constant, pallor or an anxious appearance frequent, and vomiting unusual. All patients whose pulse rate exceeded 100 on admission died within 24 hours; a favorable prognosis should not, however, be based solely on the pulse rate or volume. Kulenkampff (Deut. med. Woch., Jan. 16, 1913) lays stress on *tenderness in Douglas's pouch* as a distinguishing feature of perforation of the stomach in contradistinction to contusion of the abdomen, in which it is absent.

In reporting 3 cases of *laceration of the right coronary ligament* of the liver due to blows in the costal area on the right side, M. R. Bookman (Med. Rec., Jan. 13, 1917) gives the following diagnostic differential signs:

From a renal injury, by the absence of costovertebral tenderness, absence of blood in the urine, the pain is located by the patient more anteriorly in the flank and higher up than in renal injury. There are also signs of intraperitoneal irritation.

From a rupture of the liver bulk it differs only in degree; the symptoms are more active, collapse is added to the shock, the abdomen is held more rigid, breathing is entirely costal, and the pulse continues to rise in rapidity and fall in volume—all the signs of a grave injury to a solid intra-abdominal organ.

Fracture of the lower ribs and injury to the kidney may be associated with the laceration of the ligament and the coincidence must be borne in mind. The patients recovered.

Treatment, i. 120.—That the condition of patients with **subcutaneous rupture of the abdominal wall** may become very serious in a short time is emphasized by Dardanelli (Rif. med., June 8, 1912), who urges that any surgical procedure instituted must be thorough, all intestinal lesions being repaired, bleeding points checked, and blood-clots, when abundant, all removed. For the peritonitis arising from fecal material in the abdominal cavity good **drainage** with tubes must be established, with **saline proctoclysis and hypodermoclysis,** enterostomy and **saline flushing of the bowel** for intestinal paresis, and repeated **stomach washing** for vomiting and gastric distention. Hopp (Beitr. z. Klin. Chir., lxxii, 2, 1911) advises that where there is reason to believe that the intestine has been torn but not perforated, **opiates** and **rectal feeding** be employed for several days. For intestinal perforation immediate operation is indicated. Where the diagnosis is doubtful, operation is indicated if any suspicious symptoms appear.

Abdominal injuries, i. 102

Abdominal reaction, i. 122

Abdominal wounds due to military firearms, i. 149

In the enormous amount of literature which has recently appeared on this subject, many valuable and suggestive data are to be found. Among the contributions of special note, covering large series of cases, are those of Cuthbert Wallace, Consulting Surgeon to the British Expeditionary Force. Somewhat surprising, perhaps, is the report by this author (Jour. Roy. Army Med. Corps, Dec., 1915), that in nine field ambulances the abdominal wounds treated over a period of 6 months constituted only about 2 per cent. of the total number of cases dealt with. In a later article (Lancet, Mar. 4, 1916) he enumerates the findings in 310 operated cases as follows: Injuries to the small bowel, 90; large bowel, 73; liver, 48; stomach, 23; kidney, 13; bladder, 13; spleen, 11; ureter, 3; and pancreas, 1. These figures closely parallel those of other observers.

Regarding the nature of the missiles causing the injuries, Wallace (Pract., Sept., 1916) found them to be as follows in a series of 329 cases: Bullet, 196; shell fragment, 64; shrapnel ball, 40; bomb or grenade, 29. Only about one-third of the bullets were retained; the other missiles, on the other hand, seldom passed out.

Rifle bullets, at the range usual in the European war, still have great velocity when they strike, and failure to emerge is due chiefly to ricocheting or previous penetration of shielding objects. As in earlier wars, they have been found to cause greater destruction of tissue when at low than at high velocity. In close trench fighting, however, bullet wounds, while relatively rare, are very severe, according to J. Aleadie (Bull. et mém. de la Soc. de chir., xliiv, 489, 1916); owing to the short range, even at 200 meters, they exert an explosive effect. Shell fragments often produce extensive wounds, ragged in nature, while shrapnel balls cause much the same injuries as rifle bullets, but with a larger hole and greater bruising of tissues. Bomb or grenade fragments are characterized, as are sometimes shell fragments, by their small size and extreme velocity, the latter entailing great penetrating power. Bomb fragments wounding the small intestine—sometimes with an insignificant skin wound—cause, according to Fraser and Bates, multiple small wounds with invaginated edges and marked tendency to hemorrhage. Wounds by low velocity missiles, including spent rifle bullets, shrapnel balls, and shell fragments, are always infected. According to Karl (Deut. med. Woch., 97, 1915), rifle or machine gun bullets that pass completely through and out of the abdomen occasion greater injury than those in which the missile is retained.

Symptoms, i. 149.—The *subjective sensations* and degree of *shock* seem to vary considerably after abdominal wounds. According to Wallace (Pract., Sept., 1916), the amount of "knock-out" after injuries such as will cause prolapse of the intestines is often surprisingly slight, subjects sometimes walking a considerable distance with such injuries, with their intestines supported by a bandage. A man hit in the abdomen may be quite unconscious that his intestine is prolapsed. Small missiles penetrating the bowel may cause very little immediate pain or disturbance; on the other hand, some men shot in the abdomen, or even the limbs, with a bullet or other small projectile, experience a tremendous blow or kick which may induce unconsciousness. Intense pain occurring promptly in wounds of the lower abdomen is especially connected with penetrating buttock wounds, and is valuable in calling attention to their dangerous nature. Apart from very extensive injury, the shock in abdominal wounds seems due, in great part, to loss of blood and, later, peritonitis. Some superficial lesions on the outer surface of the liver seem, however, to cause extreme shock, sufficient to cause death without marked blood loss. Stripping up of the retroperitoneal tissue by blood causes disproportionate collapse, possibly on account of sympathetic injury. A small injury causing great pain will produce pallor and collapse with cold extremities, though the pulse be quiet and good.

Hemorrhage, as emphasized by H. H. Sampson (Brit. Med. Jour., Apr. 11, 1916), is a great enemy of the wounded subject in abdominal wounds, owing to the fact that there is little tendency toward spontaneous arrest. Three or four hours after an injury small arteries in wounded bowel are still spurting vigorously. Hence the necessity and value of rapid transportation of these sufferers to a suitably equipped operating room, in spite of the great risks often run in moving a shocked man in a jolting conveyance. Copious bleeding occurs, as stated by Wallace (Pract., Sept., 1916), from injured gastric vessels, omentum, mesentery, retroperitoneal tissue, abdominal wall (deep epigastric artery), pelvic veins, liver, kidney, and spleen. The intestinal walls, on the other hand, do not bleed to any appreciable amount. Pallor and pulse are the best criteria as to the amount of blood lost.

All wounds made by low velocity missiles, such as spent bullets, shrapnel balls, and shell fragments being infected, as well as frequently those by higher velocity projectiles, the probability of peritonitis from penetrating abdominal wounds is marked, infection from ruptured hollow viscera being likewise and, in fact, even more, pernicious. Wallace (Pract., Sept., 1916) finds reason to believe that bleeding, especially if near a wound in the bowel, may aggravate the situation by carrying infection to distant parts of the abdomen. Retroperitoneal infection may occur with or without a wound of the bowel; where the bowel is injured, the colon is usually the part implicated, the entrance wound being on the flank or loin. From retroperitoneal gas infection the peritoneum may be pushed forward as in retroperitoneal hemorrhage; such cases are nearly always fatal. The operation site, too, becomes badly infected in many instances of penetrating abdominal wound, the origin of acute infection being in the peritoneal cavity. Virulent wound sepsis may occur even after a lesion of the small bowel has been successfully dealt with by the surgeon. Death from peritonitis in abdominal wounds usually occurs on the third to fifth day, but may occur within 24 hours or in 10 days. The degree of bowel distention is a better prognostic guide than the amount of exudate present.

Intestinal injury is an almost invariable result of the entrance of a missile into a space occupied by bowels. Yet H. H. Sampson (Brit. Med. Jour., Apr. 11, 1916) has reported a case of bullet wound of this type in which no visceral perforation occurred, though the projectile must have come in contact with the bowel. This contrasts with two cases mentioned by Sir Anthony Bowlby, quoted by Wallace (Pract., Sept., 1916), in which the bowel was injured by a bullet without the latter entering the abdomen. Wounds of the small intestine, according to Sampson, are generally multiple, though usually confined to one segment of bowel. As Wallace emphasizes, small and large bowel infections show a radical difference in that, whereas the former tend to spread progressively, the latter, if undisturbed, tend to become localized. As regards the *small intestine,* there does not seem to be much danger of infection in the first few hours, but a critical period would appear to be at the eighth to the twelfth hour. The infection does not usually result from extrusion of the bowel contents, for the viscus is generally empty and paralyzed, but probably from the carrying out of infection by the projectile and the everted mucous membrane. If the time since the receipt of the wound is short, the state of the intestine, from the surgical viewpoint, is more favorable than it often is after the elaborate preoperative preparations customary in civil practice. For some hours the coils stay in the position in which they were when wounded. At a later period they are found, on the contrary, thin and distended, due to beginning infection. Small gut injuries, as a whole, are serious from their multiplicity. The lesions vary from a small perforation to complete division or destruction of a part of the bowel. Bomb wounds, small though often multiple, are favorable, usually lending themselves well to suture. Bullets cause all sorts of injuries, often as severe as those due to larger shell fragments. A bullet may completely divide the small bowel. At times the holes are so small that they only just admit a bullet; at others, are larger on both sides, due to an oblique passage through the bowel. The mucous membrane pouts through the rents, forming rosettes which are typical.

Bruises and tears of the serous and muscular coats are seen, where a bullet has passed between the coils. Fraser and Bates (Brit. Med. Jour., Apr. 8, 1916) noticed that the less the damage to the gut—when the lumen had been entered—the greater the likelihood of extensive peritoneal soiling; this is ascribed to the inhibition of peristalsis in massive injuries, which is incomplete or absent in the lesser ones. Bullets at high velocity cause small perforations of equal size; at low velocity, considerable destruction of tissue. Bleeding from the small intestine is usually severe, especially in the jejunum, and mesenteric hemorrhage is always progressive. The mortality of wounds limited to the small intestine, as reported by Wallace (*loc. cit.*) in reference to 69 cases received at the British casualty clearing stations, was 63.8 per cent.; in 61 cases of wounds limited to the large intestine it was 60 per cent., and in 16 wounds exclusively of the stomach, 43.75 per cent. The total hollow viscera mortality, including the cases of combined injuries of the small and large intestines and stomach, was 64.5 per cent., showing the increased danger of multiple injuries.

Injuries of the *large intestine* are serious from their infectivity rather than their multiplicity. They are often more difficult to find and repair than those of the small gut. The large bowel, doubtless because of the sedentary life in the trenches, is usually loaded when wounded. The loaded condition may have some relation to the infectivity of the contents, though constipation may, on the other hand, tend to limit escape. At all events, even a small wound of the large bowel is very likely to prove fatal from peritonitis. Large gut lesions are not, as a rule, multiple. Many extensive tears are caused by shell fragments, but a bullet may itself completely divide the intestine, as witnessed by Wallace in the case of the ascending, transverse, and descending colon, though not in the case of the pelvic colon. Many wounds are extraperitoneal or partly extra- and intraperitoneal at the line of reflexion of the peritoneum of the colon. The latter variety of wound is often overlooked, in spite of careful search, and if found, is very hard to suture adequately. Septic infiltration of the retroperitoneal tissue, according to Wallace (Lancet, Mar. 4, 1916), seems a frequent lethal factor in large gut wounds. Wounds of the transverse colon are more apt to be multiple than those of the other divisions of this gut. Wounds of the rectum are divided into those complicating wounds of the buttocks, ischial fossæ, or perineum, and those caused by missiles entering the lower abdomen. With the former the greatest danger is septic absorption, but, on the whole, extensive buttock wounds do not do badly at the front, being widely open from the nature of the injury. With the abdominal type, severe multiple injury of the small bowel, and also injury of the bladder, are likely to accompany the rectal wound. Septic peritonitis is greatly to be feared. According to Fraser and Bates (*loc. cit.*) septic material, in wounds of the large gut, is much more likely to be walled off by adhesions than in small gut wounds. Peritonitis from such wounds is, however, intensely virulent. The symptoms differ from those in wounds of the small bowel in not being so widespread and in the absence of early nausea.

Regarding the *diagnosis of intestinal injury,* Enderlen and Sauerbruch (Med. Klin., July 25, 1915) point out that this is the more difficult the earlier the case comes under observation. Rigidity, eructations, and vomiting may occur with but moderate injury of the liver, mesentery, etc., the intestine being unscathed. Again, a soft abdomen, absence of vomiting, and a good pulse at first may coexist with extensive bowel injury. They consider costal respiration of great significance in the early recognition of intestinal injury. Prompt operation is also called for when persisting hemorrhage is suspected. Kausch (Berlin. klin. Woch., lii, 1321, 1915) has noted that in intestinal injury even the slightest opening in the peritoneum results in a *discharge of air* through it. He therefore makes a small skin incision and a tiny peritoneal incision for this test, where the diagnosis cannot otherwise be made. Laewen (Münch. med. Woch., lxii, 1331, 1915) advises omission of morphine for two hours, when, if there is any intraperitoneal injury, vomiting, rigidity, or rapid pulse will develop. The same author, having lost two cases from aspiration of gastric contents under anesthesia, decided to evacuate the stomach with the pump before operating.

Injuries of the *stomach* show a smaller mortality than intestinal wounds, though hemorrhage from vessels supplying the organs is much to be feared. Wallace (Pract., Sept., 1916) refers to a case of wound through the left sixth costal cartilage, in which a piece of shell was found to have cut the lesser curvature and also shattered the hilum of the left kidney, causing fatal hemorrhage. Many cases of injury limited to the stomach, however, have died, after successful suture, from the effects of the primary gastric hemorrhage. Stomach wounds are usually commensurate with the size and direction of the vulnerating body, though occasionally one meets with small entrance and large exit wounds caused apparently by bullets, and sometimes the pyloric portion is severed by an obliquely side-to-side passing bullet. The escape of food from the wounded stomach depends not only on the time of the last meal, but also on the size and situation of the wound. If the wound is small and near the lesser curvature or cardiac end, little food escapes, while if it is large and near the greater curvature, marked extravasation may occur.

T. R. Elliott and H. Henry (Brit. Med. Jour., Apr. 8, 1916) show that both sutured and unsutured gastric wounds and contusions are subject to ulceration, secondary hemorrhage, and perforation, death occurring on the ninth to the thirty-fifth day from hemorrhage or peritonitis. They find wounds of the left lower *chest* more dangerous and promptly fatal than those of the right lower chest. Of 23 stomach wounds in Wallace's series, only 11 were uncomplicated by other lesions. Clinically, cases of gastric wound, according to Fraser and Bates (*loc. cit.*) show pain, sickness, collapse, abdominal rigidity, and tenderness, vomiting being especially pronounced, but the collapse less marked than usual. The respiration rate increases more rapidly in proportion than the pulse rate. Pain is worst when the pyloric or cardiac ends are involved, and collapse most marked in wounds of the curvatures.

Wounds of the *solid viscera* have proven much less fatal than those of the gastrointestinal canal, hemorrhage being the chief lethal factor. In injuries of the *liver,* Wallace's experience has been that oozing from the wounded surface generally stops in a few hours. Cases that are fatal or bleed much involve the large veins in the organ. A few cases showing only a comparatively superficial furrow on the external hepatic surface are, for some mysterious reason, profoundly shocked and die. G. H. Makins (Brit. Jour. of Surg., iii, 645, 1916) states that among 37 cases of hepatic wound, the course of the missile was transverse in 21. Simple furrows often cause more troublesome hemorrhage than perforating wounds. Shell wounds, usually extensive, often cause secondary hemorrhage, and are nearly always badly infected, necrosis and sloughing of a great part of the liver following, as a rule. With an open shell wound suppuration is the rule, but is of no great importance. Secondary abscesses, however, are a grave matter. Of the 37 cases, 25 showed complicating pleural injury; next came injuries of the stomach. Seven cases showed no physical signs of liver injury. Secondary bleeding (4 cases) usually occurs about the tenth, and always means septic infection, which causes pain, distention, fever, and rapid, weak pulse. Twelve cases showed jaundice. Some form of biliary fistula—the most characteristic sign of liver injury—was present in 15 cases, opening through the pleura in 7, all of which recovered. Of 25 deaths from hepatic injury, 60 per cent. were due to sepsis and 40 per cent. to secondary hemorrhage. The chief lethal complication was hemothorax; 7 cases died from infection from the effusion.

Gunshot injuries of the liver, according to E. Liek (Arch. f. klin. Chir., cvii, 509, 1916), give an apparently favorable prognosis similar to injuries of the upper abdomen when treated conservatively. He has observed 17 cases in which a spontaneous recovery of liver gunshot injury occurred. The modern small caliber bullets can pass through the liver from a much shorter distance than 1200 cm. without effecting irreparable harm. While smooth, completely penetrating shots end most favorably, tangenital shots are less favorable. Clear liver shots complicated with injuries of the kidney, etc., healed spontaneously.

In wounds of the *spleen,* Makins rarely made the diagnosis on any grounds but the situation of the external wounds and direction of wound track. Left hemothorax was the chief complication, followed by renal injury. Death from hemorrhage from this organ is held by Makins to be uncommon; spontaneous healing is to be expected with simple perforations and moderate lacerations of the spleen. Injuries of the *pancreas* were found, as a rule, only at operation or autopsy.

In injuries of the *kidneys,* simple perforations may, according to Makins, often be regarded as negligible. Hematuria, rarely severe or persistent, was observed in only 11 out of 27 cases. Its degree in no way accords with the severity of renal damage. External escape of urine was noted in only 7 cases. In 17 fatal cases, 7 were due to secondary hemorrhage, which occurred in 12 instances, usually about the fourteenth day. In every case of secondary hemorrhage the urine was infected. The hemorrhage occurred either as a persistent hematuria or a perirenal hematoma traveling into the iliac fossa and along Poupart's ligament, with skin ecchymoses and slight fever. According to Fraser and Bates (*loc. cit.*) extensive organic disintegration may follow merely slight renal injury.

Wounds of the *bladder* are not dangerous if uncomplicated, but, as the same observers state, intraperitoneal bladder wounds are usually complicated by injuries to the rectum and small bowel. A non-penetrating wound of the abdominal wall may cause rupture of a full bladder.

Over 90 per cent. of cases of spinal injury showed, according to Walker (Lancet, Feb. 3, 1917), a serious infection of the urinary tract. Of 111 patients, 19 died, all from this cause. In another series of 339 cases of spinal injury, 22 were transferred and 160 died, practically all from urinary infection. The newly introduced **sodium hypochlorite solutions** are intensely irritating to the bladder; a solution 1 in 20,000 solution is sufficiently strong to use at first, and this may cautiously be increased in strength. **Vaccine** treatment in the author's experience has proved of great value in treating the chronic cystitis of these paraplegic cases. In gunshot injuries to the spinal cord an early operation offers the best chance for the patient; fear of sepsis need not deter the surgeon from operating. Experience has shown that in a certain proportion of cases of injuries of the spinal cord much may be done.

Surgical treatment, i. 150.—Recent experience in the European war has disproved the earlier view that the management of penetrating abdominal wounds in war practice is fundamentally different from that of civil practice. Prosecution of the modern relatively motionless trench warfare, with facilities for rapid transference of the wounded to a suitable operating room, has shown that, properly cared for, the military patient with a penetrating abdominal wound does far better under operative than under non-operative surgical treatment. This does not militate, however, against the fact that, given unsuitable conditions, due to lack of preparation, a precipitate retreat or invasion, or long delayed treatment, the wounded may hold a better chance of survival from conservative than from radical treatment. The problem is, therefore, to establish the indications in the individual case according to the existing environment and opportunities. The former impression that abdominal wounds received in war are less fatal than in civil practice has been proven erroneous. As Toepfer (Deut. med. Woch., No. 6, 1915) states, the wounded who do not succumb to hemorrhage generally die, except in the case of gastric wounds, from peritonitis on the second to the fourth day.

While, at the beginning of the war, with the armies covering much ground, and in the absence of proper transport and hospital facilities, conservative treatment of these wounds was still deemed preferable, the consensus of opinion turned more and more toward radical treatment during the year 1915. Instances of recovery under conservative treatment were increasingly ascribed to the mistaking of non-penetrating for penetrating injuries, and Delore (Lyon chirurg., p. 229, 1915) went so far as to state that, among over 1500 cases, no penetrating abdominal wound had recovered under conservative treatment. Kraske (Münch. med. Woch., No. 22, 1915) similarly denied having seen any case of known perforation of the alimentary canal recover without operation. Rutherford Morison (Oxford War Primers, 1915) asserts that of serious abdominal injuries 20 per cent. are hopeless, and of the remaining 80 per cent., not less than 60 per cent. should recover after early operation under proper conditions. Although several surgeons have reported series of cases with a majority of recoveries under conservative treatment, most, if not all, who made a direct comparison of conservative and operative treatment obtained better results from the latter, Thus, Läwen (Beitr. z. Klin. Chir., xcviii, 1, p. 47), reports that of 21 cases treated without operation only 1 recovered, while of 21 operated on in three to eleven hours after the injury, 9 recovered. Quénu (Jour. Amer. Med. Assoc., lxv, p. 1743) argues that every penetrating wound should be operated on because the diagnosis of perforation is sometimes impossible. Boehler (Med. Klin., xi, 1232, 1915) points out that, while it is not always possible to differentiate intestinal injury from internal hemorrhage, both demand laparotomy.

Promptness in operating after reception of the injury has a most important bearing on the ultimate results. Success is greatest with patients operated within twelve hours, and the shorter the period the better.

In an analysis of the first 500 operations for abdominal war wounds, Walter, Rollinson, Jordan and Banks (Lancet, Feb. 10, 1917) urge that the time element is of the highest importance; an abdominal patient's chances diminish with every hour of delay. The vast majority of patients reached the authors after 9 or 10 hours, and a large percentage in half that time, but a certain number of cases arrived at much later periods, up to 3 or 4 days.

As Cuthbert Wallace (Pract., Sept., 1916) also specifically mentions, delay arises in the collection and transportation of the wounded, even in stationary trench warfare, not only through the difficulty of reaching the injured in "no man's land," but also very frequently through the long period of time occupied in traversing the communication trench to the rear,—a journey which even a sound man may take an hour or more to complete in fine weather. Once the wounded man is in an ambulance, very little time is lost, and one has only to consider the bad effects of jolting, which vary according to the condition of the roads at the time. Several surgeons have urged the advisability of locating the operating rooms sufficiently in the rear to avoid the injurious effects of nearby detonations on the weakened and hypersensitive abdominal patients.

While, with sufficiently rapid transportation, early collection of the wounded, facilities for conducting an aseptic operation, and an operator experienced in dealing with abdominal injuries, the consensus of surgical opinion now favors early radical treatment as a general routine in these cases in war practice, it is not maintained that there are no exceptions to the rule.

In a more recent article (Lancet, Apr. 28, 1917) the same author states that the mortality of the abdominally wounded has been reduced at the front by some 10 per cent., and the mortality is also considerably less at the base. Out of 1.288, the mortality, excluding moribund cases, was 50 per cent. The total operative mortality was 54 per cent. That of hollow viscera, 65 per cent.; of stomach, 53 per cent.; of small intestine, 66 per cent.; and of great intestine, 59 per cent. So many men with abdominal wounds treated conservatively succumb in the course of the month after the injury, according to Pribram (Wiener klin. Woch., Jan. 4, 1917), that recovery is extremely rare. The patient may even feel quite well for days or weeks, as the most dangerous processes may run an absolutely symptomless course for a time.

Which cases are best left alone? As Cuthbert Wallace (Pract., Sept., 1916) states, all are agreed that wounds of the small gut area should be explored. There is still some doubt, however, about cases of suspected stomach injury and of wounds apparently involving the colon. Wounds limited to the liver furnish most of the cases of undoubted penetration which it is advisable to leave alone; the kidney and spleen furnish a few of these cases as well. Among 511 cases there were, moreover, 145 in which intervention was out of the question, because of the severity of the wound or its complications, and among the remaining 366 operation was deemed inadvisable in 56, because of the liver being the organ involved, penetration being doubtful, etc. While hemorrhage is itself a sufficient reason for operation, especially if the case is seen early and the bleeding presumably continuing, the many cases presenting a single entry of a missile, particularly in the back, buttocks, thighs, and lower thorax, without signs of bleeding, are perplexing to the surgeon. If the latter does not feel justified in operating on principle, he must watch the pulse and the abdominal rigidity.

As a rule, within 4 or 5 hours the abdomen will harden or the pulse rise above 100, or both, if the intestine has been wounded, thus indicating operation. In lower thoracic wounds the abdominal rigidity must be discounted, but in suspicious thigh and buttock wounds, rigidity and rapid rising pulse are urgent signals for operation. Single wounds of the posterior aspect of the flanks present many difficulties. Since a median incision to explore the small bowel in such cases may lead to dissemination of a previously local infection about the colon, possibly the best course is a local exploration through a transverse loin incision, or a careful watch for abdominal involvement. With regard to stomach wounds, Wallace favors routine operation on account of the danger attending hemorrhage from vessels supplying this organ. Withholding operation, the favorable moment for dealing with this hemorrhage may be passed before the signs of anemia appear; or, there may be associated lesions of other organs that will prove fatal.

Exceptions to the routine gastric operation are cases with a bullet entering posteriorly near the midline and emerging about the midaxillary line, such a wound being likely to involve the posterior gastric wall, and if at all high up, being very hard for the surgeon to reach and suture. Likewise to be treated conservatively, for the same reason, are posterior wounds of the lower thorax in which possibly the stomach may have been injured near the esophagus. According to Col. T. C. English, Consulting Surgeon to the British Army at Salonika (Lancet, Oct. 28, 1916), in injuries of the liver and kidneys in which one feels sure the hollow viscera have escaped, especially in rifle bullet wounds, operation usually seems contraindicated. Expectant treatment is also usually wise in cases in which the projectile has apparently traversed the top of the abdomen, diaphragm, and lower part of the chest, most of these patients having hemothorax and the abdominal lesions being difficult of access.

The only complete contraindication to operation observed by Walter, Rollinson, Jordan and Banks (Lancet, Feb. 10, 1917), aside from the condition of the patient, is a complete spinal lesion with paralysis. A wound of the chest definitely involving the lung with hemoptysis or surgical emphysema are almost always better if left alone.

Regarding the *management* of abdominal cases *before operation*, English (*loc. cit.*) asserts that patients not fit to be rapidly transported to the operating station should be kept absolutely **quiet**, warm, and under **morphine; saline infusion**, hypodermically or otherwise, is most beneficial. When the condition has improved, the pulse falling below 130, they may be transported to the operating station. All patients whose condition is good when they reach an operating station should be dealt with surgically at once; otherwise 2 to 8 hours should be spent in preparative treatment similar to that already mentioned. (See page 1, on anteoperative management.) Operation is never advisable if the pulse is 140 or over. In patients treated expectantly, the same measures are to be continued. Fluid should be given by mouth or rectum, or subcutaneously, according to circumstances. A patient wounded in the lower abdomen or pelvis can take frequent small drinks of **water** with the best results; if wounded in the gastric region he can have fluid by rectum or subcutaneously. J. Abadie (Bull. et mém. de la Soc. de chir., xlii, 489, 1916), in the preparation of patients with severe hemorrhage or nervous shock, uses **camphorated oil, ether,** and **saline injections** with 1/60 grain (0.001 Gm.) of **adrenalin. Intravenous saline infusion** is continued during the operation if the pulse indicates its use. Riedlinger (Münch. med. Woch., Sept. 22, 1914), in rabbit experiments, carried out to learn how best to protect prolapsed intestines before operation, obtained the best results with **liquid petrolatum** poured over the exposed bowels; **glycerin** and **vaselin** also proved effectual in warding off peritonitis in some of the rabbits. G. Kelling (Zentralbl. f. Chir., Apr. 3, 1915), likewise on the basis of rabbit experiments, recommends that all patients with gunshot wounds of the abdomen have a tight compression bandage tied round the abdomen immediately after the first aid dressing has been applied, and kept on during transportation to the operating station, the experiments indicating that the compression of the viscera prevents bowel contents from escaping by forcing other loops against the opening, and thus prevents or localizes peritonitis, besides causing hemorrhage from parenchymatous organs to cease. The bandage is, of course, most effective when applied immediately after receipt of the injury.

In operating for abdominal wounds, according to English (*loc. cit.*), the **abdominal exploration** must be systematic and rapid. The duration of the operation should rarely exceed 45 minutes. In cases of doubtful penetration, he regularly explores the wound, having thus discovered intestinal injuries repeatedly at an early stage before there were any external signs of their existence. Fraser and Bates (Brit. Med. Jour., Apr. 8, 1916) likewise deem it necessary to get the patient thoroughly warm before operation, and to minimize shock in every way, the room being well heated and the table provided with a **hot water bed.** They recommend operating these cases in the **Trendelenburg position.** Just before beginning, **subcutaneous saline** administration is started, and this is continued throughout the operation, 3 or 4 pints of fluid being thus given. Henderson's **closed ether anesthesia** is preferred by these operators. Stevenson and Mackenzie (Lancet, July 29, 1916), as a rule, give **morphine** and **atropine** hypodermically before operation, but usually omit saline solution beforehand, relying on subcutaneous and intravenous injection during and after the operation. For skin preparation the **iodine** method is used, except for large wounds when, after anesthetization, **lysol** is generally employed.

The **incision** made is usually large, that all the abdominal contents may be examined. Quénu's (Bull. et mém. de la Soc. de chir., xli, 1815, 1915) incisions were generally either through the entrance and exit wounds, or a median incision above or below the umbilicus, as indicated. Recalling that hemorrhage is likely to begin afresh or greatly increase, directly the abdomen is opened, Wallace (Pract., Sept., 1916) points out the advantage of a large incision in facilitating the finding of the bleeding point. The cavity should be carefully cleaned, for even without a bowel lesion the blood may become infected and cause later trouble. Fraser and Bates (*loc. cit.*), where there is much blood, quickly swab it away with a long roll of dry gauze before examining the viscera. In early cases with extensive peritoneal soiling they wash out the peritoneal cavity; in later cases, and those with signs of peritonitis, they do not. **Drainage** by a single Keith's tube passing into the pouch of Douglas prove sufficient; in special instances local or flank drainage is necessary.

Stevenson and Mackenzie (*loc. cit.*) carefully wash the intestine with **saline solution** while it is outside the abdominal wound, and gently sponge off all fecal material and doubtful lymph. The abdomen is also well washed out with saline solution or hypochlorous acid and mopped dry. Leaving a quantity of saline in the abdomen seemed to benefit some cases. Intraperitoneal **ether injections** in grossly infected cases seemed to cause unnecessary shock, though good results were obtained in cases in which the infection had been localized, *e.g.,* appendix cases. Large **drainage tubes** were inserted into the pelvis, and also the flanks in bad infection. Mayo-Robson (Brit. Med. Jour., Dec. 4, 1915) states that where a case is seen late and peritonitis has already set in, a small **suprapubic incision** for insertion of a tube to the bottom of the pelvis, with the **Fowler position,** will give the patient a chance of recovery.

As regards the methods of *surgical repair in intestinal wounds,* Fraser and Bates (*loc. cit.*) state that in simple **suture** of the small gut it is essential that the wound be small, with edges undamaged and mesentery intact. Wounds by bomb fragments are ideal for suture. The wound edges were not excised, and linen thread was employed. Resection and **anastomosis** are indicated in the event of numerous perforations, extensive injuries, and mesenteric involvement. **Lateral** is to be preferred to end-to-end anastomosis, being less likely to be followed by paresis and distention of the proximal segment. **Resection** and **enterostomy** are indicated only as an emergency measure in rapidly developing collapse during operation. Stevenson and Mackenzie (*loc. cit.*) sewed up wounds in the intestine with fine thread in two layers. When resection was necessary, end-to-end anastomosis was usually employed, except where several feet of intestine had to be removed, when lateral anastomosis was performed, being undoubtedly stronger. Where suture is possible, they prefer it to be in the transverse axis of the intestine rather than longitudinal. Complete division of the bowel in gunshot wounds was comparatively common, in their experience.

Läwen (Beitr. z. Klin. Chir., xcvii, 47, 1915) repaired most intestinal injuries with **interrupted sutures,** some with **purse-string sutures.** The abdominal wound was sutured in layers, but a few **wire sutures** were inserted through all the layers, the patients having possibly to be moved suddenly at any time. He also (Münch. med. Woch., lxii, 1331, 1915) found it necessary to resect the intestine in only 3 out of 54 cases. He painted the intestine with **tincture of iodine** before suturing with silk sutures. According to Wallace (Lancet, Mar. 4, 1916), resection has a higher mortality than suture (74 instead of 44 per cent.), but this is doubtless due to greater initial injury among the resected cases. Resection may have to be substituted for suture where saving time is an object. The actual junction line, in the resected cases, rarely gave trouble. After suture, contused edges were found to heal well. Three cases of obstruction after resection were due to a non-toxic paralysis. J. Rotter (Med. Klin., Jan. 3, 1915) reports a case in which seven holes in the small bowel were sutured eight hours after the injury. In one place the gut had been almost severed. The patient made a smooth recovery.

Lockwood, Kennedy, Macfie and Charles (Brit. Med. Jour., Mar. 10, 1917) found in 356 operated cases that for injuries of the *small intestines* either **pursestring suture** or resection should be employed, the former being given preference wherever possible. When resection is required end to end anastomosis seems to give better results than lateral and is more rapid. Intestinal paresis is effectually prevented by milking the intestine from just above the distended area to below the line of suture. Wounds of the *solid viscera* are usually best if left alone unless they are very much soiled. The *diaphragm* may be wounded and give a bad prognosis unless repaired at once, when the outlook becomes very good. Extravasated material is best removed by mopping with gauze wrung out of hot saline. Saline should never be used for lavage of the abdominal cavity. In general the abdomen should be closed and drainage tubes should never be inserted down to the site of the internal injury. Fowler's position combined with pelvic drainage should be employed wherever possible after bad peritoneal soiling.

In *wounds of the colon,* according to Fraser and Bates (*loc. cit.*), the procedures best adapted are simple suture and simple suture with colotomy, resection being deemed inadvisable. In cases coming to hand later than 24 hours, enlargement of the original wound and drainage is the best plan, on the possibility that the infection is becoming localized. Drainage of the retrocolic space is recommended in all cases.

E. Quénu (Bull. et mém. de la Soc. de chir., xli, 1815, 1915) lays stress on the fact that circular suture of the large bowel is much more dangerous and less effective than that of the small bowel. Wallace (Jour. ot the Roy. Army Med. Corps, Dec., 1915) states that intraperitoneal wounds oi the colon may be sutured, but if the rents are large, a colostomy, especially in the vertical colons and flexures, is the safest course. *Retro-peritoneal wounds* are best treated by establishing an artificial anus, a free opening being left at the sides to drain the infected areolar tissue Mayo-Robson (Brit. Med. Jour.. Dec. 4, 1915) closed wounds of the colon and duodenum with purse-string sutures. English (Lancet, Oct. 28, 1916) quotes Wallace as giving the mortality of operations on the large bowel as 59 per cent. in 86 cases, and on the stomach, 44.5 per cent. in 25 cases. In 4 cases of *suture of the cecum* there was no mortality.

In *wounds of the stomach,* Fraser and Bates (*loc. cit.*) employ a left rectus incision, occasionally enlarging it laterally. When the situation of the wound is doubtful, an incision parallel to the left costal margin is used. After inspection one of 3 procedures is carried out: Simple suture, gastroenterostomy, or pylorectomy with partial resection, according to the conditions found. Wallace (Jour. Roy. Arm. Med. Corps, Dec., 1915) believes all stomach wounds should be sutured.

In *wounds of the liver,* Makins (Brit. Jour. Surg., iii, 645, 1916) adopts a purely expectant treatment at the base hospital. If the missile is readily accessible, it may be removed; otherwise no fresh incision is made. In the case of the *spleen,* spontaneous healing is to be expected in simple perforations and moderate lacerations; death from hemorrhage from this organ is uncommon. Läwen (*loc. cit.*) believes expectant treatment justified in *liver* injuries if associated intestinal injuries are improbable. Early operation is, however, indicated for copious intra-abdominal hemorrhage. The hepatic wound is then tamponed. In 2 cases he closed injuries of the *gall-bladder* with a double row of silk sutures. The *spleen* was removed in 1 case and sutured in 2, all 3 recovering.

In *injuries of the kidneys,* as Makins (*loc. cit.*) points out, rest is paramount. Operation is rarely required for primary hemorrhage, though a hopelessly damaged kidney should be removed. For secondary hemorrhage, nephrectomy is also indicated, and is often difficult, owing to the comminution of the organ and blood extravasation. Among nephrectomies, recovery occurred in 6. A large *blood-clot in* the *bladder* should be removed with the lithotrity evacuator or by suprapubic cystotomy. In *primary hemorrhage from* the *bladder,* suture, packing, or partial removal may be tried. Among three kidney wounds Fraser and Bates (*loc. cit.*) employed simple drainage and nephrectomy in one, with recovery in all three patients. Of 4 cases of bladder injury, 3 succumbed. Stevenson and

Mackenzie (*loc. cit.*) note that in slight renal wounds the kidney apparently may be left alone without much danger; urinary fistulæ usually heal up quite well.

In the *after-treatment* of operated cases of intraperitoneal injury, Meyer and Taylor (Lancet, Jan. 1, 1916) give 8 minims (½ c.c.) of **pituitrin** on the second or third day, simultaneously injecting 2 ounces (60 c.c.) of **glycerin** into the rectum, to be repeated the next day if necessary. About the fifth day an **enema** is generally given, except where the pelvic colon had been sutured. Regurgitant vomiting is treated by **gastric lavage,** repeated as often as necessary. In operating the peritoneal cavity is rapidly but carefully mopped, and drainage instituted for from 24 to 48 hours. Of 50 operated cases, 33 recovered. Läwen (Münch. med. Woch., lxii, 1331, 1915) noticed that intestinal function was regained with remarkable rapidity after operation in his cases—generally in about three days. Of 54 operated cases, 27 recovered. The same author (Beitr. z. Klin. Chir., xcvii, 47, 1915) urges the keeping of operated cases in the hospital until all possibility of complications is passed, unless removal becomes absolutely necessary; nonetheless, an operated patient endures transportation better than one not operated upon.

Enderlen and Sauerbruch (Med. Klin., July 25, 1915), report a recovery percentage of 44.4 per cent. in 211 operated cases of intestinal wounds. The ratio of cures increased from month to month with earlier recognition of symptoms and operative treatment. In their later experiences the cases reached the field hospitals after only two to four hours' delay. **Saline infusion by the drop method** is recommended. Direct blood transfusion has been abandoned. No difference in outcome between flat and half sitting posture of the patients could be perceived. **Heat** to the abdomen proved of great assistance, and **rest** was of great significance in the outcome. An advantage of operative treatment is that the patient can soon be given nourishment. Kausch (Berl. Klin. Woch., lii, 1321, 1915) recommends operation in all cases of intestinal perforation, whether the armies be entrenched or on the march at the time. He has never seen a case die after operation that had a chance of recovery under expectant treatment.

[The **Dakin, Dakin-Carrel solutions** and other newer methods of treating wounds have been reviewed in full under Wounds, Treatment, in the eighth volume, page 815. See also Wounds, this Index.—Ed.]

Operative Results.—The last report published when this work was issued was that of Cuthbert Wallace (Lancet, Apr. 28, 1917). Out of 263 wounds of the abdomen at an advance station, the patients operated on between 1 to 6 hours after wounding were 43; recovered, 27, or 62.8 per cent.; died, 16, or 37.2 per cent. In 8 of the fatal cases the patients had such severe injuries that recovery was practically hopeless and they would not have survived to reach the operating room had they been brought in later. Patients operated on between 6 to 12 hours after wounding, 33; recovered, 12, or 36.3 per cent.; died, 21, or 63.7 per cent. Patients operated on between 12 to 16 hours after wounding, 18; recovered, 3, or 16.6 per cent.; died, 15, or 83.4 per cent. Patients operated on over 24 hours after being wounded, 11; recovered, 5, or 45.4 per cent.; died, 6, or 54.6 per cent.; recoveries at 48, 36, 33½, 32 and 30 hours, respectively. In 110 laparotomies 1 kidney was found to be wounded in 14, in association with other injuries. In none was operation necessary for the kidney condition alone, although damage to this organ was fairly frequently met with, as shown by pain and hematuria. Six months' work gave the following results: Total number admitted with abdominal wounds, 263; recovered, 136, or 51 per cent.; died, 127, or 49 per cent.

In a study of 300 perforating wounds of the abdomen, Fraser and Drummond (Brit. Med. Jour., Mar. 10, 1917) state that the prognosis of such cases depends upon a great variety of features. Thus, uniforms worn a long time may prove to be a source of severe infection. On the whole, however, uncomplicated perforating wounds of the *small intestines*, operated under suitable conditions recover. This applies also to wounds of the *stomach*, but only when uncomplicated, which occurs rarely. Wounds of the *colon* impose a grave prognosis owing to liability to infection of the peritoneum. Uncomplicated wounds of the *solid viscera* warrant a good prognosis. An important factor, however, is the lapse of time since the injury was sustained, early operation offering the surest chance of success.

In 123 perforated abdominal gunshots treated 4 to 5 km. behind the trenches, reported by Mertens (Beitr. z. klin. Chir., H. 16, 235, 1916), 91 had and 32 did not have gastro-intestinal injuries. In the first category 35 were clean injuries of the gastro-intestinal canal, 22 were operated with 40.9 per cent. recoveries; 12 were conservatively treated with only 16.6 per cent. recoveries. Of 56 gastro-intestinal wounds combined with injuries to other organs, 5 were operated upon with 20 per cent recoveries; 51 were conservatively treated with 11.5 per cent. recoveries. The author's experience led him to favor early operative treatment of abdominal gunshot injuries.

Abdominal wounds, non-penetrating, i. 130

In this type of abdominal wound, as in abdominal contusions (*q. v.*), chief interest attaches to the question whether *injury to* one or more *intra-abdominal organs* coexists. According to H. Riedel (Deut. med. Woch., Jan. 11, 1912) the best sign of such injury is rigidity, coupled, if there is abundant hemorrhage, with a small pulse, pallor, a pinched facies, and vomiting. Even slight abdominal trauma may entail severe symptoms, which, however, gradually decrease in intensity, whereas if actual organic injury has been occasioned, their intensity continues to increase. Claybrook (Surg., Gyn. and Obst., Jan., 1914) lays stress on transmission of the cardiac and respiratory sounds, so that they are audible over the whole abdomen almost as well as over the chest, as a sign of internal injury and positive indication for immediate laparotomy. This sign may already be present one-half hour after the injury, never exists in extraperitoneal injuries, has no relation to rigidity, and is ascribed to irritation of the parietal peritoneum through the outpouring of foreign material into the abdominal cavity.

Besides the immediate grave results of abdominal contusions resulting in visceral rupture, etc., Récamier and Luynier (Presse méd., p. 449, 1916) state that there may be other local effects which cause special symptoms: pain, sharp then dull and persistent, in the left hypochondrium, and a fluctuating tumor projecting considerably under the left costal border. In such a case the authors reached the tumor by the lumbar route, and in the *kidney* opened a large cavity containing 1.5 liters (quarts) of serosanguinous fluid. The patient recovered but with a fistula. A similar result occurred in a second case, the transperitoneal route being used. The authors deem the lumbar route the best to avoid complications.

M. Kahn (Jour. Amer. Med. Assoc., Mar. 7, 1914), discussing in detail the symptoms of *rupture of the intestine*, gives rigidity first place. Absence of shock signifies nothing. Vomiting is important when persistent. Obstipation is very common, and pain usually intense, oftener general than local, and persistent. The pulse rate, at first usually slow, is apt to rise gradually later. Local tenderness, rapidly increasing in severity and area, is a sign of great value if superficial injury can be excluded.

A. B. Kanavel (Jour. Amer. Med. Assoc., Mar. 7, 1914) writes particularly of traumatic *extraperitoneal rupture of the duodenum,* the mortality of which is much higher than rupture of any other part of the intestine. A toxemia, other than bacterial, is a factor in this, and the diagnosis is based on excessive local tenderness and pain with nausea and vomiting shortly after the injury.

Surgical Treatment, i. 130.—In simple wounds of the abdominal wall the treatment is the same as in wounds elsewhere, special attention being, however, paid to **restoration of tensile strength** of the parietes. As Riedel (Deut. med. Woch., Jan. 11, 1912) states, the treatment of *infected wounds* penetrating down to the peritoneum is usually difficult, pus tending to spread between the muscular layers and sometimes infecting the peritoneum. The latter can be prevented only by repeated **opening and evacuation** of the various **pus pockets** as they form. As regards *injuries of internal organs,* Kahn (Jour. Amer. Med. Assoc., Mar. 7, 1914) points out that while the history in cases of rupture of the intestine is sometimes misleading, it is yet of primary importance, and when initial symptoms persist, especially rigidity and pain, an **exploratory operation** is warranted. (See also Abdominal Contusions, and Intestines, etc., Rupture of, this Index.)

Abdominal wounds, in *civil life,* i. 130. (See also page 5, this Index for *military* penetrating wounds).

The extensive recent literature on penetrating abdominal wounds in military practice has already been reviewed in the foregoing pages, under Abdominal wounds due to military fire-arms. The material offered under the present heading is derived chiefly from contributions on such wounds as observed in civil practice.

Diagnosis, i. 132.—Absolute accuracy of the diagnosis of rupture of the intestine in acute abdominal conditions is seldom possible, according to S. M. Hay (Can. Lancet, Feb., 1912). Rupture of *ectopic gestation, pyosalpinx, appendicular abscess, gastric* or *duodenal ulcer,* or *ulcer of* the *gall-bladder* are probably the only cases in which the typical symptoms—sudden, intense abdominal pain, collapse, and vomiting—occur. In one of his cases, severe pain was present for a short time after an abdominal injury, then subsided. Rigidity and superficial tenderness were lacking. Pain set in again soon after, resisting opiates, and the patient gradually went into collapse. Twelve hours after the accident a surgeon was called in, but the patient was moribund. Autopsy showed rupture of the small intestine. M. Kahn (Jour. Amer. Med. Assoc., Mar. 29, 1913) cautions against dogmatism in gunshot abdominal injuries, in asserting that portions of the body distant from the wound of entry are not involved. Thus, in the case of a boy accidentally shot with a 22 caliber rifle, the bullet entering the external aspect of the right thigh at its middle third, death from peritonitis took place on the fourth day. Thorough exploration for distant perforations is urged, as many cases have been lost through neglect of repairing all wounds.

Prognosis, i. 137.—Randolph Winslow (Jour. Amer. Med. Assoc., Oct. 3, 1914) reports 44 cases of penetrating abdominal wounds, all in civil practice. Of 6 cases without laparotomy, 4 died. Among 38 penetrating wounds the mortality was 45 per cent.; among 31 penetrating wounds of hollow viscera, 51.5 per cent.; among 25 gunshot wounds of hollow viscera, 60 per cent., and among 6 stab wounds perforating hollow viscera, 16.3 per cent. Of 7 cases of injuries of the liver, spleen, and other structures, with no involvement of hollow organs, 6 recovered. Stomach perforation occurred in 11 cases, with 5 recoveries, and intestinal perforations in 29 cases, with 15 recoveries. M. Kahn (*loc. cit.*) operated in 7 out of 13 cases of abdominal gunshot wound; of these 7, 6 were pure abdominal cases with intestinal perforations operated on within eight hours after the accident, and 5 of the 6 ended in recovery.

hemorrhage, surgical treatment, i. 144 (for medical treatment see p. 61, this Index).
postoperative treatment, i. 141
preoperative treatment, i. 141

Surgical Treatment, i. 139.—J. Y. Brown (Surg., Gynec. and Obstet., June, 1914) recommends, before resorting to **operative exploration** in acute abdominal conditions, unless the patient has vomited blood, that the **stomach** be **washed out** before the anesthetic is given. The abdomen should be prepared in the usual way, and the wound of entrance carefully explored. No information whatever can be obtained by the use of the probe. Upon opening the abdomen, the liver and spleen should be examined, and any hemorrhage from either organ dealt with. If such hemorrhage cannot be controlled through the median incision, it is advisable to cut the rectus at right angles, thus enabling the operator quickly to control the hemorrhage and producing less shock than would a forcible retraction of the median incision and rough handling of the injured viscera. The anterior border of the stomach should now be examined, and if no perforations are found, a rent made in the gastrocolic omentum, and the posterior wall of the stomach and pancreas examined. In patients profoundly shocked the writer usually starts irrigating the abdominal cavity **with saline** as soon as the peritoneum is incised, a stab wound being made above the pubis with the drain placed in the vesicorectal pouch and the saline flowing from the tube. Perforations of the bowel can best be closed either by a purse-string suture or a through-and-through stitch, supplemented by the Lembert stitch. In multiple perforations it is far better to resect than to suture if there is the slightest question regarding the blood-supply to the bowel. In the after-treatment, morphine is rarely needed. **Proctoclysis** with tap water **by** the **Murphy method** is of value. The Fowler position has been virtually abandoned.

Payr (Münch. med. Woch., Aug. 18, 1914) points out that the blood and fecal matters escaping through bullet holes in the bowel gradually work their way downward into the small pelvis and are not absorbed. Often an abscess forms, and later walling-off adhesions are broken down and secondary peritonitis results, usually extremely serious. There are two ways to render harmless the infected extravasated blood: (1) When the patient is seen in the first 24 or 48 hours a very small laparotomy incision is made above the symphysis (under local anesthesia) just large enough for a rubber drain the size of the finger, to be carried down into the small pelvis. The patient keeps in a half-sitting position or lies on his side. (2) When not seen until later, the space between the rectum and the bladder must be carefully examined through the rectum. If there is any tenderness, protrusion, tenesmus or difficulty in micturition, the region is opened up at once. If the swelling is circumscribed, the incision can be made in the rectal wall for evacuation of the extravasated blood. If there is no circumscribed swelling, but the whole region seems swollen and very painful, a parasacral operation is done, the coccyx being enucleated, the rectum exposed and the anterior reflection of the peritoneum incised. The drain introduced into the small pelvis should be held with a stitch, and the wound left open and lightly tamponed. This treatment yields excellent service in many forms of peritonitis after injury and perforation of abdominal organs.

Basdékis (Beitr. z. klin. Chir., xcvi, 223, 1915) in a review of 63 cases of abdominal injury, some in civil life, others in the Balkan War, states that in operating in stab wounds the cut was merely extended; in gunshot wounds an incision was made near the entrance wound and a second perpendicular to it if necessary. If omentum was prolapsed it was replaced or ligated with catgut and removed, and the stump buried in case it was soiled or inflamed, as it often was. If intestine was prolapsed, it was carefully cleansed and then replaced. If so severely injured by torsion or incarceration that there was doubt of its recovery, either an artificial anus was formed or the intestine protected with iodoform or damp sterile gauze and left outside until its condition improved so that it could be replaced.

For the toilet of the abdominal cavity either lukewarm sterile water or sterile salt solution was used. If even the slightest amount of intestinal contents has escaped, the abdominal cavity must not be irrigated, but only sponged for fear of scattering infective material. Blood must also be thoroughly removed.

To find injuries of the intestine or mesenteric vessels the intestine is drawn out bit by bit, examined and replaced. If there is profuse hemorrhage or much intestinal contents in the peritoneal cavity, eventration may be necessary. An injured mesenteric vessel is ligated at once with catgut, but sometimes may necessitate resection of the intestine. The abdominal wound must not be entirely closed if there is the slightest suspicion of infection.

Polk (Med. Rec., Feb. 7, 1914) has reported a case of *extensive gunshot wound of the abdomen* in which all of the left lateral surface of the abdominal wall and the deeper portions down to the intestine were blown off, including the crest of the ilium and the lower lumbar spinous processes. The great difficulty at operation was to find peritoneal covering for the intestine. An outer cover was obtained by transplanting adjoining skin and subcutaneous fat, chiefly from below. To prevent adhesions of the intestine to these tissues, the omentum was brought over and stitched in place. Nine years later the initial good result was still maintained, the abdominal surfaces having been kept in place and the subject enabled to live the life of an ordinary individual.

C. C. Green (Jour. Amer. Med. Assoc., July 15, 1916) has reported 6 cases of *stab wound of the diaphragm* with evisceration of the stomach and other organs upward through it. In all cases the hernia was easily reduced after a supplementary thoracotomy, and 4 of the patients recovered.

Abducens paralysis, see Strabismus, viii. 400

Ablution friction, viii. 809

Abortion, i. 152

Practically all that has been contributed on this subject in recent years of sufficient value to be recorded has applied to treatment, as shown below.

Pathogenesis, i. 159.—The prevailing view that syphilis is a prominent factor in the causation of abortion has been denied by Trenchese and others. In a summary of 679 cases of abortion at the Michael Reese Hospital, Lackner (Surg., Gynec. and Obstet., xx, 537, 1915) also found that syphilis was an etiological factor in but 4 per cent. of abortions.

Cooledge (Jour. Med. Research, July 1916) holds that the view that *Bacillus abortus* (Bang) is pathogenic for human beings is not proven, although it is possible to cause antibodies for *Bacillus abortus* to appear in the blood-serum of adults by feeding a milk which is naturally infected with *Bacillus abortus* and which contains the *Bacillus abortus* antibodies.

Williams and Kolmer (Am. Jour. of Obstetrics, vol. lxxv, p. 194, 1917) found, however, that complement fixation reactions with the polyvalent antigens of bacillus abortus (Bang)

and bacillus abortivo-equinus and the sera of 50 women aborting in the early months of pregnancy yielded negative results.

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  open air in, i. 176
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impending (see threatened, below).
incomplete, treatment of, i. 172
  uterovaginal, **iodoform tamponade** in, i. 172
  with sepsis, **salt solution** in, i. 172

Treatment, i. 164, 172.—In the Michael Reese Hospital from 1912 to 1914 by J. E. Lackner (Surg., Gynec. and Obstet., xx, 537, 1915) the treatment of incomplete abortions consisted in **tent dilation** from 8 to 24 hours, **digital emptying** of the uterus when possible, otherwise **curettage**, followed by intra-uterine irrigation of ½ per cent. **iodine**. When the history and physical findings were those of an incomplete abortion, the **uterus** was emptied within 24 to 36 hours after the patient entered the hospital. This was done whether or not there was any temperature. Despite the cultural findings, which in 50 cases showed the usual number of anaërobic and aërobic bacteria, the uterus was emptied in 24 to 36 hours. The value of this advice is indicated by the low mortality: .06 per cent. in 579 cases.

A study of the literature by J. Soler Julia (Revista de Ciencias Medicas de Barcelona, May, 1916), and of 169 cases treated by **curettement** led him to conclude that the proper routine was curettement in all women who show either hemorrhage or retained detritus after miscarriage, and that it was important to maintain uterine drainage by tubes. **Hysterectomy** should only be done in the rare cases of uterine gangrene without generalized infection.

J. O. Polak (Amer. Jour. of Obstet., Apr., 1916) used **pituitrin** in 20 cases of incomplete abortion without curettage; spontaneous evacuation occurred in none. He concluded that it was ineffectual and retarded rather than favored the evacuation of the contents.

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  indications for, vii. 636
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Abortion, induction of, indications for (*continued*).
        pelvic deformities, vii. 634
        pernicious anemia, vii. 634
        placenta previa, vii. 637, 640
        prolonged pregnancy, vii. 636
        pulmonary tuberculosis, i. 179; vii. 634

M. Kunreuther (Berl. klin. Woch., li, 1628, 1914) states that according to Heimann's statistics, 73 per cent. of tuberculous patients get worse during pregnancy and 49 per cent. of them die. Fellner-Schauta observed exacerbations in 68 per cent. of the cases that had become stationary. Predella found that 95 per cent. of 1035 cases observed by him grew worse, and Essen-Möller that 50 per cent., even under good sanitarium treatment, grew worse or died. Kunreuther thinks it best to sterilize at the same time abortion is performed to avoid the danger of future pregnancies, tuberculous patients being particularly fertile. This procedure should be limited to women who have already had children, and those in whom the tuberculosis is manifestly being made worse by the pregnancy. The best method is abdominal supravaginal high amputation of the uterus, leaving the adnexa.

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        retroflexion of uterus, i. 181
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Abortion, method of inducing by drugs (*continued*).
            ergot in, vii. 641
            pituitary gland in, vii. 641
            pituitrin in, i. 780; vii. 641

J. L. Bubis (Amer. Jour. of Obstet., April, 1916) found that it was possible to empty the uterus in the early stages of pregnancy in a few minutes with the aid of pituitrin and a curette, with very little loss of blood and without shock or collapse even in the most severe cases. No hot irrigations were required to assist in the expulsion of the fetus or placenta, nor were any irrigations or packing employed after evacuation of the uterus. The injection of 1 c.c. (15 minims) of pituitrin was given after the cervix had been dilated, while the patient was under the anesthetic.

In some instances the curette was unnecessary, strong pains beginning within a few minutes and entirely expelling the uterine contents. Where the uterus was unable to evacuate itself, the curette was used to separate the adherent placenta from the uterine wall, a procedure which caused practically no bleeding, even if the placenta was removed piecemeal, owing to the firm, hard condition of the uterine wall due to the drug. The uterine cavity was wiped dry with gauze and swabbed with 5 per cent. iodine solution. It decreased in size as rapidly as its contents were removed.

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      cleansing and shaving of vulva in, vii. 635
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      creolin in, vii. 635
      iodoform gauze in, vii. 635
      mercury bichloride in, vii. 635
  missed, i. 176
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Of 1137 cases in the polyclinic at Kiel, studied by O. Hoehne (Jahresb. f. ärztl. Fortbild., v, 18, 1914) 31.8 per cent. were febrile; 41.7 per cent. complicated with peri- and para-uterine infections. The mortality of the febrile cases was 11.6 per cent.; that of the complicated abortions 27.8 per cent. The mortality of all the abortions, including the afebrile ones, was 3.69 per cent.

    cocaine in, iii. 490
    curettage in, i. 173, 174

There is marked tendency among leading authorities toward conservative treatment and limiting the use of the curette. Thus, our associate editor, Prof. E. E. Montgomery (Jour. Amer. Med. Assoc., Oct. 9, 1915) found that during the 5 years, inclusive from 1910 to 1914, there were treated, in the gynecologic wards at Jefferson Hospital, 296 patients, the great majority of whom suffered from infection, many being well advanced and practically hopeless. Many of them had undergone curettement prior to entering the hospital; 127, or nearly 43 per cent., were subjected to some surgical procedure after admission. Careful analysis of the cases convinced him that a smaller mortality would have occurred had these patients been received before they had been subjected to any surgical interference and the treatment confined to non-surgical measures. It should be remembered that, even admitting the retention of embryonic products, the infective organisms do not limit themselves to the local area. If they have not already invaded the blood, the manipulation necessary to explore and remove the retained tissue breaks down the barriers nature has erected against further invasion.

J. O. Polak (L. I. Med. Jour., Dec., 1913) also concluded, from a study of nearly 2000 cases of puerperal infection that the endometrium should not be curetted in streptococcic infection, curettement of the placental site being an important cause of pelvic thrombophlebitis. When the interior of the uterus is left undisturbed the infection generally remains confined within it, and parametric and peritoneal complications seldom follow. Except in abortion cases of less than 7 weeks, where the uterus is retroflexed, absolute non-interference with the uterine cavity in all infections reduces the mortality and minimizes the morbidity.

W. Benthin (Monatsch. f. Geburtsh. u. Gynäk., xlii, 162, 1915) shows that the advocates of the active treatment have not had as good results as those who use the expectant plan. While the latter gave a morbidity of 9.8 per cent. and a mortality of 0.8 per cent., the active treatment gave a morbidity of 29 per cent. and a mortality of 9.8 per cent. The mortality with hemolytic streptococci was 31.2 per cent. with active treatment and zero with conservative. The strictly conservative treatment is reserved for the cases showing hemolytic streptococci.

The bacteriology of the case should determine the procedure adopted, according to Traugott (Med. Klinik, July 6, 1913). Conservative treatment in 231 cases of streptococcus abortion at the Frankfurt Clinic

showed its value. Certain germs, colon bacilli, non-liquefying staphylococci, etc., proliferate only in the retained clots and membranes in the uterus, but they have no power to penetrate into sound tissue. If, therefore, bacteriologic examination shows only one or more of these species in the uterine cavity, it is a simple and harmless matter to empty the **uterus with** the **fingers, insert** a **strip of gauze** and **tampon the** vagina, giving possibly a little **ergot.** The physician can then wait patiently for the woman to get well, confident that his course has been absolutely correct. But if bacteriologic examination reveals streptococci, liquefying staphylococci, or gonococci, then the slightest local intervention may promote the spread of the infection in the uterus; all that can be done in this case is to keep the woman absolutely still in **bed,** with **nourishing, appetizing food,** with **abundance of water** as beverage and by **subcutaneous** or **rectal infusion.**

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F. R. Oastler (N. Y. Med. Jour., Mar. 31, 1917) recommended the use of **dilute hydrochloric acid** in 20-drop doses every 3 hours to arrest the hemorrhage, as frequently efficacious.

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opium in, i. 164
packing in, i. 167
pituitrin in, i. 779

H. D. Furniss (Surg., Gynec., and Obstet., Sept., 1916) gives 1 c.c. (16 minims) of **pituitary extract** hypodermically before curetting for incomplete abortion and finds that it produces firm uterine contraction, which makes the curettement easier and almost bloodless.

potassium bromide in, i. 165
rest in, i. 167
saline purgatives in, i. 167
viburnum prunifolium in, i. 164, 170
tubal, i. 184

Proust and Buquet (Rev. de gynéc. et de chir. abd., xxiii, 353, 1916) state that of the 75 cases of bilateral tubal gestation reported in the literature, about 41 may be considered as simultaneous gestations. But 8 of these cases are doubtful, reducing the figure to 33 cases.

Practically the diagnosis of bilateral pregnancy is never made before intervention. On intervening for a tubal pregnancy, the annex on the opposite side should always be examined. If a hematosalpinx is found it must always be removed, because there is the possibility of there being a tubal gestation susceptible of ulterior rupture.

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morphine in, i. 195
saline solution in, i. 196
strychnine in, i. 195
Abrams's method in aneurism, i. 682
Abrasions, **benzoin tincture** in, ii. 456
glyceritum amyli in, v. 30
Abrin, vi. 92
Abrus precatorius, see Jequirity, vi. 92
Abscess, i. 197, 198
aconite in, i. 201
airol in, i. 486
alcohol in, i. 532
ammonium chloride in, i. 621
amyloform in, i. 623
antiferment serum in, i. 205
antiseptic soap in, i. 202
autogenous vaccine in, i. 202
bacterial vaccines in, i. 202; ii. 335, 362
belladonna ointment in, i. 202

Abscess (*continued*).
Bier's hyperemia in, i. 203; v. 591, 592 593
bismuth paste in, i. 205
boric acid solution in, i. 202, 207
brewers' yeast in, i. 201
calcium sulphide in, i. 201
carbolic acid solution in, i. 202

Konjetzny (Zentralbl. f. Chir., Nov. 14, 1914) has been using **phenol-camphor** for years in abscess with excellent results, employing Chlumsky's formula: 30 parts liquefied **phenol** and 60 parts **triturated camphor** with 10 parts **alcohol.** It is especially useful in pyocyaneus infection and tetanus, but there is danger of phenol poisoning if used too profusely in large cavities. Gauze is moistened with the solution and wrung out and placed over the lesion.

O. Geiger (Beitr. z. Klinik d. Infekts. u. z. Immun.; Med. Rec., Oct. 10, 1914), referring to earlier observations of Lorey and Küstner, tried their **phenol-serum treatment,** which is as follows: 300 c.c. (10 ounces) of serum obtained from 1 liter (quart) of fresh horse's blood was diluted 10 times with salt solution and then mixed with 5 per cent. phenol. The mixture was injected into abscess cavities after evacuation, or packed with tampons saturated with the solution. The results were invariably a rapid demarcation of the necrotic tissues, and prompt disinfection and healing. These results followed more quickly than in any other method of treatment.

cataphoresis in, i. 202
cocaine in, i. 202
digitalis in, iv. 158
drainage of, **novocaine anesthesia** in, vii. 103

Chaput (Bull. Soc. de Chir., xlii, 163, 1916) replaced the use of tubular drains in purulent cavities by **filiform drains,** consisting of threads of varied caliber. They act by capillary attraction. The threads may be silk or rubber and from 3 millimeters or less to 6 or 7 millimeters in large cavities. They drain far better than tubes, and permit a more rapid recovery with an insignificant scarring.

A little **retractor,** resembling somewhat an eye speculum, is inserted by Tiegel (Zentralbl. f. Chir., July 19, 1913) between the lips of an incision into an abscess and leaves it in position for hours to allow the pus to escape freely. This hastens the healing process.

[Such a contrivance or "spreader" might be used to wash out and treat abscess effectively. Ed.]

ether in, iv. 642
ether local anesthesia in, iv. 691
ethyl bromide in, iv. 694
ethyl chloride in, iv. 697, 699
guaiacol in, v. 147
hot-air hyperemia in, i. 204
hydrogen dioxide in, i. 202, 208
hypophosphites in, i. 201
iodine in, i. 202, 206
iodine (nascent) in, vi. 45
iodine-ether in, vi. 38
iodoform bone-wax in, i. 205
iodoform glycerin in, i. 208; vi. 52
iodoform ointment in, i. 208
leucofermantin in, i. 206
light therapy in, vi. 361
mercury bichloride in, i. 202, 207, 208
naphthalene in, vi. 786
normal blood-serum in, i. 201
nux vomica in, i. 201

A continuous stream of **oxygen** or **air** into the base of putrid abscesses is recommended by Steinmann (Deut. Gesellsch. f. Chir., 1914). A rubber drain as large as possible is passed into the base of the abscess; into this a narrower rubber catheter is introduced and connected by a tube with an oxygen tank or an air blast. The oxygen mechanically removes the secretion and kills the anaërobic bacteria. There is rapid disappearance of the odor, the secretion is promptly reduced, and soon the drain can be shortened daily and, as a rule, removed after a few days.

perhydrol in, v. 570
puncture and disinfection in, i. 208
quinine sulphate in, i. 201
salt solution in, i. 207

Abscess (*continued*).

- **silver nitrate** in, i. 202
- **sodium chloride and citrate** in, i. 204; viii. 193
- **sodium nuclein** in, i. 208
- **staphylococcus vaccine** in, i. 202; ii. 362
- **streptococcus vaccine** in, i. 202; ii. 335
- **sulphuric ether** in, i. 208
- **superheated air** in, i. 202
- **surgical measures** in, i. 206
- **thyroid gland** in, i. 201
- **vaccines** in, i. 202; ii. 335, 362
- **veratrum viride** in, i. 201
- **warm fomentations** in, i. 202
- **Wright's solution** in, viii. 193
- **X-ray** in, i. 206

E. P. Cumberbatch (Lancet, May 16, 1914) 2 years ago tried the effect of **X-rays** upon a case of chronic suppuration of very long duration, which had resisted other forms of treatment, including surgical operation. The suppuration was arrested, the part was healed, and the cure has lasted to the present time. Several other cases of a similar kind were then treated, and equally good results were obtained.

- alveolar, vi. 729; see also Alveolar Abscess, this Index.
- amebic liver, **emetine** in, iv. 451
- anal, **sodium iodide** in, vi. 29
- beginning, **ammonium acetate** in, i. 615
- brain, see Cerebral Abscess, iii. 73; also this Index.
- cavities, **ichthyol** in, v. 639
  - **lysol** in, viii. 503
  - **pepsin applications** in, vii. 363
- cerebral, see Cerebral Abscess, iii. 73; also this Index.
- chronic, **iodoform glycerin** in, vi. 52
- cold or tuberculous, i. 209; see also Adenitis, this Index.
  - **arsenic** in, i. 213
  - **aspiration** in, i. 211
  - **aspiration and injections** in, i. 212
  - **Bier's hyperemia** in, v. 594
  - **bismuth paste** in, ii. 474
  - **boric acid** in, i. 213
  - **camphor** in, i. 213
  - **carbolic acid** in, i. 212

Camphor seems to annul or counteract the destructive action of phenol on the tissues, according to Pohl (Zentralbl. f. Chir., May 24, 1913). He used 30 parts **phenol,** 60 parts **triturated camphor** and 10 parts **alcohol,** injecting this mixture directly into the lesion in cases of old rebellious effusions and destructive inflammatory processes in joints, and recurring rheumatic joint affections displaying a tendency to develop into arthritis deformans. The results were always excellent, but general sepsis was not apparently benefited by the injections. Yet in his 2 cases of the latter type (1 patient dying), the temperature dropped decidedly after the phenol-camphor injections.

[When reaction fails to occur in cases complicated with general sepsis, small doses of **calomel,** by stimulating the ductless glands, enhance the bacteriolytic action of the blood. Large doses have a contrary effect. C. E. de M. S.]

- **codliver oil** in, i. 213
- **creosote** in, i. 212
- **decortication** in, i. 212
- **guaiacol and creosote** in, i. 212
- **hydrogen dioxide** in, i. 212
- **hypophosphites** in, i. 213
- **incision** in, i. 211

E. A. Rich (N. W. Med., July, 1916) holds that incision of a cold abscess dooms it to infection with all of the dire consequences from chronic sinuses through amyloid disease to death. Even retropharyngeal abscesses should be drained only through aspiration. In very chronic cold abscesses cure is not infrequently possible as a result of repeated **puncture** and complete **aspiration** with suction.

[Our associate editor, Prof. Robert T. Morris, of New York, referring to tuberculous glands of the neck (see also Adenitis, this Index), called attention two years ago to the fact that in the large number of cases treated by him in the New York Post-Graduate Hospital in recent years, he had only resorted to operation those abscesses that were actually suppurating. All others were

treated conservatively to avoid general infection, including miliary tuberculosis. In a number of cases the use of the new high-penetrating **X-ray** proved most effective. More recently he has added **tuberculin** to the other resources, and is convinced that when this method is applied in the right way and for a sufficient length of time it is one of our most important resources against tuberculosis of any kind. C. E. de M. S.]

  iodides in, i. 213
  iodine in, i. 213
  iodoform in, vi. 51, 52
  iodoform glycerin in, i. 212; vi. 37
  iodoform, ether, and distilled water in, i. 212
  iodoform gauze in, i. 212
  iodoform-oil emulsion in, vi. 37
  naphthol and **camphor** in, i. 213
  nutritious food in, i. 213
  olive oil in, i. 212
  paraffin in, i. 212
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deep-seated, **potassium hydroxide** in, vii. 576
following appendectomy, **autogenous vaccines** in, ii. 371
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indolent sinuses from, **silver nitrate** in, viii. 136
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mammary, see Mastitis, vi. 542; also this Index.
of cerebrum and cerebellum, see Cerebral Abscess, iii. 73; also this Index.
of the ears, see Ear, Abscess of, iv. 712
of eyelids, see Eyelids, Abscess of, iv. 720; also this Index.
of lung, iii. 160
  pneumotomy in, iii. 190
of prostate, viii. 708

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  incision in, viii. 708
of septum, vii. 92
palmar, viii. 504
perianal, **cocaine** in, iii. 490
perinephric, **quinine** in, iii. 385
periosteal, **bismuth paste** in, ii. 474
psoas, **staphylococcus vaccine** in, ii. 366
pulmonary, see Lung, Abscess of, iii. 160, vi. 441; also this Index.
  pneumotomy in, iii. 190
renal, see Pyelitis, vi. 178; also this Index.
retropharyngeal, vii. 432
secondary, in surgery, i. 18
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stitchhole, **Bier's hyperemia** in, v. 598
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  surgical measures in, i. 96
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warm, i. 198
A. C. E. mixture, iii. 265
Acanthocephalia, vii. 319
Acetabulum, fractures of, iv. 779
Acetanilide, i. 213

Physiological Action, i. 216.—Acetanilide, antipyrin, and acetphenetidin, according to Piccinini (Arch. Inter. de Pharm. et de Thérap., vol. xxii, Nos. 1 and 2), lower the total amount of oxygen in the circulating arterial blood. The diminution is slight with antipyrin, which, in fact, in large and medium-sized doses causes at first an increase. With the other two agents the decrease is both pronounced and constant. The variations in the amount of carbon dioxide in the blood are not parallel with those in the oxygen. The respiratory functional capacity of the blood and the respiratory interchanges are diminished.

Stevenson (Mich. State Med. Soc. Jour., Apr., 1914) conducted experiments to ascertain whether acetanilide appeared in the milk of a nursing mother, and, if so, whether in sufficient quantity to cause the death

of an infant. They showed that acetanilide derivatives are at times eliminated, but that more frequently there is no trace of them in the maternal milk or the infant's urine. The quantity found in each case was so minute that it could only be detected by holding the specimen against a white background. The time of the first appearance of the reaction after the administration of a dose of 4 grains varied from 7 to 15 hours.

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  alcohol baths in, i. 220
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  ether in, i. 222
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  hot applications in, i. 221
  nitroglycerin in, i. 222
  oxygen in, i. 222
  saline solution in, i. 222
  strychnine in, i. 220, 221, 222
  strychnine nitrate in, i. 219
  whisky in, i. 219, 221
poisoning, chronic, i. 222

Treatment, i. 224.—According to Gordinier (Monthly Cyclo. and Med. Bull., Mar., 1912), study of the cases recorded in the literature and personal cases proves that the ingestion over a considerable period of time of acetanilide or related coal-tar products is productive of a definite symptom-complex which is highly suggestive, if not absolutely diagnostic, of poisoning by this group. The subjective symptoms are: great general weakness, nervous excitability, insomnia, loss of appetite, digestive disturbances, palpitation, dyspnea, numbness and weakness of the extremities, pain in the region of the liver and spleen, and faint attacks. The chief objective symptom is cyanosis, which is often extreme, but usually fluctuating in intensity, accompanied by marked pallor of the mucous surfaces and without clubbing of the fingers.

The blood-changes are quite characteristic, and due to the destructive action of a hemolytic poison circulating in the blood-stream, which produces a secondary anemia variable in degree. The erythrocytes are diminished in number; they often present nucleated forms, show granular stippling, stain poorly, and are variable in size and form. There is usually a moderate leucocytosis of the polymorphonuclear variety, and there is often a relative increase of the lymphocytes. The appearance of the blood as it stands upon the finger-tip or the ear is very suggestive; it is either of a bluish-black color or chocolate in appearance. The coloration of the plasma renders the estimation of the hemoglobin quite difficult.

  codeine in, i. 224
  digitalis in, i. 224
  morphine in, i. 225
  saline aperients in, i. 224
  strychnine in, i. 224
  tonics in, i. 224
Acetic acid, i. 228
  poisoning, i. 228

Treatment of Acute Acetic Acid Poisoning, i. 229.—Excellent results were obtained by Dillon (Russky Vratch, xiv, No. 29, 1915) from **lavage of the stomach** preceded by a **morphine** injection to relieve the shock. The esophagus must be soothed by giving the patient by mouth pure **olive oil**, 200 Gm. (6½ ounces) in 24 hours, keeping this up for 7 or 8 days if needed, followed later by sweet cream, raw eggs, mucilaginous substances and butter, and gradually ordinary solid food. Water can be given in the form of rectal injections of **normal salt solution**, 100 or 150 Gm. (3½ or 5 ounces) every 2 hours, or by the drop method. The mouth should be kept

clean and rinsed with some antiseptic solution. Of 120 cases of poisoning from various caustic substances thus treated but 1 died.

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chalk in, i. 229
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morphine in, i. 230
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Fehr's, i. 239
Gerhardt's, i. 241
Gunning's, i. 240
Legal's, i. 237
Le Nobel's, i. 238
Lieben's, i. 239

Neither Legal's, Chautard's, nor Lieben's test will detect small quantities of acetone when performed with urine without distillation. After distilling, the iodoform test (Lieben's) is very satisfactory, provided the detection is made by examining microscopically for crystals in form of hexagonal plates or small stars rather than by the odor of iodoform. This test, although reliable, is time-consuming, and Muhlberg (Med. Rec., Dec. 27, 1913), therefore, prefers Frommer's test, which may be applied to the urine direct. It is as follows: About 10 c.c. of urine are treated with about 1 Gm. of sodium hydroxide in substance, and, without waiting for it to dissolve, 10 or 12 drops of a 10 per cent. solution of salicylaldehyde in absolute alcohol are added. The mixture is heated to 70° C. In the presence of acetone a marked purple-red color develops at the zone of contact with the alkali. This test can indicate the presence of 0.000001 Gm. acetone in 8 c.c. of water.

Unless the urine is diluted so that its specific gravity is reduced to about 1.010, confusing colors occur that render interpretation difficult. When it is properly diluted, however, urine containing only minute or normal quantities of acetone will give, after 10 or 15 minutes' standing, a straw or faintly pink color. Checked against the iodoform test, the Frommer reaction was found very reliable.

Malerba's, i. 240
miscellaneous, i. 241, 242
nitrocyanide, the, i. 240
Penzoldt's, i. 240
preliminary, i. 237
Reynold's, i. 240
chloroform, see Chloretone, iii. 217

Acetonemia in diabetes, see Diabetes Mellitus, iv. 8; also this Index.

There is considerable confusion at the present time between acetonemia (due to the presence of acetone bodies, betaoxybutyric acid, aceto-acetic acid and acetone in the blood) and "acidosis," clinicians in general referring to these conditions as if they were identical. So competent an observer as C. G. Kerley (77th Annual Session Amer. Med. Assoc., 1916) mentions cases in which there was a distinct acetonuria, and to others in which there was a distinct acidosis. Those which showed acetonuria were children fed with too much milk. Most children of run-about age received too much fat and too much sugar. These show high fever; about 60 or 70 per cent. of them show acetonuria. A small percentage of cases of pneumonia, scarlet fever, and other conditions accompanied by a fever also show acetonuria. In these children the power of assimilation of carbohydrates seems to be held in abeyance and acidosis follows. Howland (*ibid.*) also urged that cases of recurrent vomiting were not due to acidosis, but to acetonuria, which is not acidosis. The latter occurs when there is a diminished alkali reserve, which causes recurrent vomiting only exceptionally. The only symptom of true acidosis is hy-

perpnea, *i.e.,* the exaggerated breathing of the air-hunger type; it may occur without fever or vomiting. Finally, Moore (Amer. Jour. of Dis. of Children, Sept., 1916) states that many cases of acidosis in infancy and childhood are not accompanied by an increase of acetone bodies in the blood sufficient to account for the severity of the acidosis.

Diagnosis.—The presence of acetone in the blood of *children*—acetonemia—due to fat ingestion is associated, according to Silberstein (Münch. med. Woch., July 23, 1912), with markedly coated tongue, vomiting, pallor, and fever. This syndrome sometimes follows the ingestion of codliver oil. Repeated attacks in the same child have been traced to the ingestion of whipped cream, milk, cheese, etc. A fruity odor of the breath and acetone in the urine usually accompany these attacks.

Fröhlich (Norsk. Mag. f. Laegevidenskaben, Apr., 1916) noted, besides the foregoing symptoms, thirst, oliguria, urticaria, herpes, pains in the joints, pruritus (the two latter also mentioned by J. P. Crozer Griffith), all of which may precede vomiting, mucomembranous colitis (Comby), and tachycardia. The vomiting may last from a few hours to several weeks. Improvement sets in as suddenly as the attack began, acetone being eliminated in large amounts in the breath and urine immediately before, thus proving a connection between the two.

Blodgett (N. Y. Med. Jour., Aug. 28, 1915), referring to cases of contagious disease, accompanied by acetone in the urine, states that in almost all there is a sore spot that can be found on deep pressure over the region of the pancreas. This spot can be distinguished from the abdominal muscular soreness that follows attacks of vomiting by the fact that it is only found on deep pressure, and is, perhaps, only 2 inches in diameter, over the pancreas.

Etiology.—Referring to the periodical vomiting acetonemia of children, Fröhlich (*ibid.*) holds that defective utilization of fat as well as of carbohydrates plays some part in the disturbance. Hecker ascribed the greatest share in this periodical acetonemia to retarded development of certain organ-systems or groups of cells which are especially concerned in the digestion of fat, such children being at all times close to the limit of their digesting capacity for fat. Anything that causes them to step over this limit is liable to bring on a reaction, an intoxication, manifested clinically by vomiting, prostration and elimination of acetone.

Bucknell (Atlanta Jour.-Rec. of Med., Mar., 1916) deems it an error to state that while the cyclic attack is in progress little can be done to stay it. Many children vomiting for days, till nearly pulseless, may be promptly relieved. Body fluids being rapidly drained while there is inability to take liquids by mouth, **water** should be supplied **by rectum,** or, if diarrhea exists, by **hypodermoclysis.** If the stomach contains irritating substances, it should be washed out with **sodium carbonate solution.** The colon should also be **irrigated,** and a solution of **sodium bicarbonate** given **per rectum,** to be retained if possible. To depress the vomiting reflex, **bromides** and **chloral hydrate** may be used **by rectum,** though chloretone gave the writer better results. Where vomiting is not too severe, a solution of **chloretone** (1½ grains—0.1 Gm.—a few drops at a time, in a child about one year old) may be given by mouth, or through a stomach-tube, after stomach washing with sodium bicarbonate solution. To make up for the deficiency of carbohydrates 4 to 8 ounces (120 to 240 c.c.) of a 5 per cent. solution of **dextrose** should be administered, **by rectum,** in alternation with sodium bicarbonate solution already mentioned. After a few hours of treatment, vomiting usually ceases. If it recurs, the enemas are to be repeated. As soon as the vomiting has ceased and a cathartic, such as calomel and milk of magnesia, has, if necessary, been given, feeding may be resumed, unless otherwise contraindicated.

Fenner (N. O. Med. and Surg. Jour., Nov., 1914) considers it worth while to try the effect of fractional doses of **calomel** in the beginning. Soda is usually vomited, particularly if given in the large doses indorsed by so many authorities. At best, except in very weak solution, it is a nauseous dose. If frequently repeated it becomes a positive irritant. He has seen children of 2 to 2½ years of age, who could retain their food, such as condensed milk, but who would begin to retch the moment the nurse approached with the dose of soda. Yet the soda was continued.

The sovereign remedy for these cases, in his opinion, of vomiting is **morphine**. It may be given hypodermically, or in the milder cases by mouth, in very small doses, combined with a tiny dose of **cocaine**, and a few grains of **magnesia** in a little chloroform water or plain water. Once the vomiting has been arrested, one may attempt to neutralize the acid condition with **alkalies**. The agonizing thirst and the dehydration of the tissues are met by the **Murphy drip**. During the slumber or drowsiness produced by the morphine, the rectal tube can be slipped in without arousing any protest from the baby.

Acetonuria, i. 231

The possible temporary appearance of considerable amounts of acetone bodies in the urine due to abnormal and irregular fermentation of sugars and starches in the intestine is employed by Derham (Lancet, July 31, 1915). They are absorbed therefrom to be excreted in the urine. These bodies are probably not very toxic *per se*, the serious general disturbance of cellular metabolism in diabetes with acidosis being the cause of the gravity of the symptoms rather than the presence in the circulation of the acetone.

Wm. Muhlberg (Med. Rec., Dec. 27, 1913) found that in diabetes acetone begins to appear in the urine particularly when the patient cuts down his carbohydrate food. In the milder forms, where 100 Gm. of starch may be consumed without production of glycosuria, the urine is free of acetone. But in the medium or severe grades of diabetes, the urine is never either sugar-free or acetone-free at the same time. Care in the selection of the diet, alkaline treatment, and consumption of antiketogenetic substances may limit acetone production somewhat, but, practically, this may be disregarded. Therein lies the importance of the acetone test. In some cases a rigid diet renders the urine sugar-free, but acetone is always present.

Bonnamour and Joubert (Presse méd., Nr. 14, 130, 1913) hold that acetonuria may be the index of acidosis, but in itself is not an indication of imminent diabetic coma. It is not evidence of the presence of diabetic acid.

Etiology.—Vomiting occurs in a large percentage of cases after anesthesia. The liability to vomiting is increased, according to Chalfant (Jour. Amer. Med. Assoc., Sept. 14, 1912), when acetone is found in the urine. Protracted vomiting is best treated by **sodium bicarbonate by the bowel** and by **lavage.**

Frew (Proceed. Royal Soc. of Med., Mar., 1912), from observations on the urine of 662 children, concludes that in the vast majority of cases acetonuria following anesthesia in children is quite independent of it, and is the result of a temporary inability on the part of the digestive functions to prepare certain carbohydrates for absorption. This is dependent upon the change of diet when the child is brought to the hospital and prepared for operation, with consequent temporary carbohydrate starvation.

Acetone occasionally accompanied by diacetic acid was eliminated in the urine of 182 out of 214 consecutive surgical patients observed by Bradner and Reimann (Amer. Jour. Med. Sci., Nov., 1915). Acetone and dia-

cetic acid were eliminated oftener and in large quantities in women than in men. The severity of the operation and the amount of obvious shock had but little bearing on the amount of eliminated acid and the time of elimination. The more emotional, frightened, or anxious individuals invariably were more shocked, and also showed more acetone.

Piper (Lancet, Aug. 23, 1913) noted that pain in the pelvis or abdomen, such as that in appendicitis or salpingitis, will produce diaceturia, and disappears when the attack passes away, and also if pancreatin be administered. If the pain persists, or reappears at short intervals, the diaceturia persists in spite of the pancreatin, although it will be greatly lessened thereby. If the pain becomes more acute the patient begins to vomit.

Treatment.—Piper (Lancet, Aug. 23, 1913), comparing the 3 agents used: **sodium bicarbonate, glucose,** and **pancreatin,** found that sodium bicarbonate had little or no effect, that glucose had an appreciable effect, but was simply dwarfed out of existence by the pancreatin. He gave 25 grains (1.6 Gm.) of the latter again as soon as possible after operation, and in only one case out of a large number did he find any acetone present, and then only a trace.

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Acidity of gastric contents, tests for, i. 253
Acidol (betaine hydrochloride), v. 549
Acidosis and acid intoxication, ii. 269

The prevailing conception of the biochemistry of acidosis (close of 1916) is well expressed by L. J. Henderson (Assoc. of Amer. Physicians, May 9-11, 1916) as follows: Any disturbances of acid-basic equilibrium, the main change in which is a loss or *deficiency of blood bicarbonates* (which stand third, with water first and sodium chloride second, in importance in the blood), though especially subject to fluctuations owing to the constant physiochemical interchanges between the blood and the respired air. Normally the ratio of free carbon dioxide and bicarbonates is kept fairly constant by the mechanism of aëration. The maintenance of the acid-base equilibrium becomes more complicated in pathologic states, however, and always is related to and dependent on the general metabolism of the body. Beneath all metabolism is a constant diminution of blood bicarbonates; unless this repaired acidosis follows.

The body protects itself against the morbid influence of these acids in three ways, according to Howland

and Marriott (Amer. Jour. of Obst., Mar., 1916). (1) Acids displace carbonic acid from the sodium bicarbonate and sets carbonic dioxide free. The latter is then removed by increased pulmonary ventilation—hyperpnea, *i.e.,* increase of respiratory movements or exchanges, leaving a neutral sodium salt (oxybutyrate, chloride, etc.), which the kidneys can readily eliminate. (2) Elimination of the acid, as shown by the ability to excrete an acid urine when the blood is nearly neutral. (3) The production by the body of an alkali ammonia, capable of neutralizing the acid. Van Slyke (*ibid.*) emphasized the fact that acidosis may also be caused, not only by an overproduction of acids, but also through retarded elimination of them.

Etiology.—We have seen under Acetonuria that acetone acidosis was due in children to the excessive consumption of fats, cream, etc. In true acidosis, as stated above, and as Bassler (Amer. Med., June, 1916) words it, we are dealing "with decreased alkalinity of the blood." This is usually due in normal children to a diet in which basic salts, such as those supplied by vegetables, cereals, citrus fruit, etc., are too scant. Such children show as prominent symptoms recurrent vomiting and hyperpnea, or exaggeration respiration without cyanosis, as shown below. It is also, as is well known, commonly observed in diabetes, and in infantile diarrhea.

Pregnancy may also give rise to acidosis, probably owing to the excessive use of the maternal basic salts by the fetus. W. S. Gordon (N. Y. Med. Jour., Mar. 15, 1913) warns that one should be especially on the watch for a toxema from this source not accounted for by kidney involvement or the retention of urea lest grave and unsuspected complication develop.

The toxemias of pregnancy cannot be attributed, however, according to Losee and Van Slyke (Bull. Lying-in Hosp. of City of N. Y., Jan., 1917), to failure of diaminization of the amino-acids, nor to the moderate degree of acidosis observed. The nature of the toxin or toxins therefore remains unknown. Again, A. Hunter (Can. Lancet, Feb., 1917) states that among nephritic cases there seems to be no relation between the degree of the acidosis and the severity of the dyspnea. It would seem that in cardiac cases without renal involvement the dyspnea is due to several different causes, including acidosis, obstruction to the gaseous exchange in the lungs, and hyperexcitability of the respiratory center.

In a study of 68 normal pregnancies, however, L. A. Emge (Amer. Jour. of Obstet., Nov., 1916) found, with the aid of 4 tests, that acidosis was present in the great majority of instances. In view of his results he suggests hesitation in drawing conclusions as to its significance.

Many other disorders, medical and surgical, may also cause acidosis. Thus Crile (Trans. of the Med. Soc. of the State of New York, Apr. 26 to 29, 1915), in enumerating the conditions in which it occurs, mentions the fatigue of the athlete, Graves's disease, fever, emotions, cyclic vomiting, Bright's disease, surgical shock, anesthesia by ether, chloroform, nitrous oxide, toxemias due to intestinal stasis, asphyxia, starvation, diabetes, and other conditions. These are regarded as activators of energy transformation through the adrenals which they stimulate, causing an abnormal output of adrenin, thereby increasing respiratory activity and oxidation, and leading to an increased production of acid by-products.

[This generalization is too broad. We doubtless have increased oxidation and metabolism as a result of an increased output of adrenin (rôles which, by the way, my own labors first pointed out), with the co-operation, I would add, of the thyroid secretion. We cannot, however, attribute *all* the forms of acidosis mentioned to this process. Thus, cyclic vomiting, shock, starvation, deficiency of carbohydrates, and other conditions are not promoters of "excessive kinetic activations," as Crile words it, but rather of the reverse, *i.e.,* of disorders in which oxidation and metabolism are slowed. When such is the case, the normal balance between the acids and bases (mainly sodium bicarbonate) in the plasma is disturbed, and acids accumulate in the blood (acidemia) *passively, i.e.,* owing to deficient catabolism and elimination of their end-products. Indeed, from my viewpoint, we should recognize, with the ductless glands as participants in the process, at least three general types of acidosis:—

1. *Passive acidosis due to deficiency of basic salts,* mainly sodium bicarbonate, as in recurrent vomiting, due to foods lacking in basic salts, infantile diarrhea with acetone breath (acetone here because the food administered is rich in fats, such as those in cream, rich milk, butter, etc.), starvation, gastric ulcer, diabetes with acetone breath (due to deficiency of lipase), surgical shock, cardiovascular lesions in the aged, for example.

2. *Active acidosis due to overproduction of acids* as wastes in the course of excessive metabolism, as in violent exercise, athletics, intense mental excitement or labor, pregnancy, etc.; or produced as a result of abnormal autodefensive activity, as in acute fevers, Graves's disease of toxic orgin, toxics of intestinal origin, chloroform, ether, cancer, hepatic and gastrointestinal disorders of an adynamic type, autoinfections of tonsillar, gingival and nasal origin, etc., in all of which the ductless glands are overactive.

3. *Obstructive acidosis due to renal, intestinal and cutaneous disorders* in which the elimination of acids is inadequately performed or arrested, as in Bright's disease and other organic disorders of the kidney, nephrectomy, constipation, extensive burns, etc., causing not only retention of acids with other wastes, but increasing the activity of the ductless glands as factors of the defensive mechanism, thus still further augmenting wastes including various acids.

The importance of discriminating between these three classes asserts itself especially when the therapeutics of acidosis is in question. C. E. DE M. S.].

Symptomatology, ii. 270.—The salient symptoms of acidosis due to *miscellaneous causes* are hyperpnea, or increase of respiratory movements, the purpose of which is to hasten the elimination of the acid, sighing respiration, nausea and, in severe cases, vomiting, which may be brought on by the mere act of swallowing and a sweetish apple-like odor of the breath. All these symptoms are, of course, in addition to those of the causative disorder.

In *diabetes* a severe degree of acidosis, which may occur irrespective of any suggestive indication in the urine, may give rise to headache, vertigo, faintness, somnolence, nausea and vomiting, and hyperpnea, or air-hunger, besides the peculiar apple-like odor of the breath. These symptoms should be taken jointly as danger signals of impending diabetic coma.

In children *intermittent vomiting* is commonly observed, the attacks recurring usually every three or four weeks in most instances. It is mainly observed in high-strung, nervous and hypersensitive subjects. Besides the sweetish breath, there may be dryness of the tongue, mouth and pharynx, and thirst. Fever, ranging from 102° to 104° F. (38.9° to 40° C.), may develop. In mild cases such an attack may occur after dietetic indiscretion, particularly in children that have been subjected to a diet mainly composed of milk, and other foods in which basic salts are scant.

In the more severe cases, as stated by Louis Fischer (Amer. Med., June, 1916), a stuperous or even semicomatose condition and marked fever may appear. The eyes seem sunken and have dark circles about them. A typhoid state with profound toxicity, or meningitis, may be suggested. Vomiting is pronounced and marked by the slightest quantities of food or fluid ingested. Abdominal and gastric tenderness may be such as to suggest appendicitis. Edema and icterus may also appear. Examination of the urine in such cases indicates a large quantity of acetone, traces of albumin, and traces of diacetic acid. Howland and Marriott (Jour. Am. Med. Assoc., Jan., 1916) refer to a diminution of the output of urine as striking evidence of acidosis in infancy.

A form of acidosis associated with certain *intestinal disorders* was observed by Chapin and Pease (Trans. Amer. Med. Assoc., June 17, 1916). Many of the children did not show acetone or diacetic acid in the urine, and the illness was out of all proportion to the symptoms. The children became cyanotic, then stuporous, finally coma supervened. The tongue was sometimes coated and had a red margin. The temperature was not high except when death was approaching, when it rose to 104° F. (40° C.) or more in some. What vomiting there was ceased as the stupor and coma came on.

In a study of the relationship between acidosis with diarrhea in 200 infants, Schloss and Stetson (Amer. Jour. Dis. of Children, Mar., 1917) found that those suffering from severe diarrhea with toxic symptoms often show the following signs of acidosis: 1, decrease of the carbon dioxide of the blood and alveolar air; 2, decreased carbon dioxide combining power of the blood plasma; 3, high ammonia coefficient in the urine; 4, increased tolerance to sodium bicarbonate; 5, improvement of the symptoms after administration of sodium bicarbonate. These signs are evident in some cases of diarrhea before the typical symptoms of intoxication have developed, and serve as a warning and therapeutic indication. If an infant suffering from severe diarrhea has hyperpnea, the diagnosis of acidosis is almost certain. If hyperpnea is not observed the diagnosis of acidosis must rest on laboratory evidence.

A form following *weaning* was described by Abt (*ibid.*). At first there were vomiting and diarrhea, and, later, rapid breathing, pallor, and obstinate constipation. The urine contained tyrosin and leucin, as well as acetone and diacetic acid. He observed 3 cases in one family, and states that the third child was saved by treatment with glucose and sodium bicarbonate.

J. L. Morse (*ibid.*) refers to cases following *bacterial infection,* general or originating from a local focus, in children. In most instances the only symptoms observed were vomiting, increase of the respiratory excursions and diminution in the amount of urine. Large amounts of acetone bodies were found in the urine. Some of the cases proved fatal.

The multiplicity of factors which may produce acidosis is well shown by cases reported by E. Cecil Williams (Brit. Jour. of Dis. of Children, Nov., 1915), some of which were due to *toxic foods,* including mussels and ice-cream. The cases, all in children, presented symptoms suggesting meningitis, but an examination of the cerebrospinal fluid proved negative.

Diagnosis.—The information afforded by acetone tests is unreliable in the sense that acidosis may be present and acetone fail to appear in the urine. A negative acetone test affords, therefore, no diagnostic information. The clinical signs of acidosis, however, plus simple office tests, are virtually conclusive.

[Thus, even if acetone tests fail, we have (1) hyperpnea, or air-hunger, and inability to hold the breath (*vide infra*) more than 30 seconds; (2) and the *methyl-red test* (the *solution*—available at chemist's), 1 drop of which, on filter-paper wet with the urine (avoiding ante-breakfast urine), turns it red, thus indicating acidity (which would be yellow if the urine were alkaline), acidosis is undoubtedly present. If besides these signs there is recurrent vomiting the acidosis is severe. The degree of severity may be gauged by dropping on the same wet paper *para-nitrophenol.* If the urine is alkaline or weakly acid, the spots will turn yellow with a tinge of green; if strongly acid, no change of color will be noticed, thus indicating a strongly acid urine and intense general acidosis. Or, a drop of *dilute phenolphthalein solution* in a sample of urine will turn it pink or crimson if alkaline, according to the intensity of the alkalinity, but if acid no change of color will be observed. Litmus-paper is useless, and often misleading. C. E. DE M. S.]

Again, the presence of *betaoxybutyric acid* in the urine may prove of diagnostic value, for it never occurs normally. It is often associated with acetonuria and diacetonuria in diabetes, sometimes in fever, and is believed by von Jaksch, to be the immediate cause of diabetic coma. Simon states that the excretion of more than 25 grains of betaoxybutyric acid indicates impending coma. Diacetic acid is usually formed first, then acetone and betaoxybutyric acid. Its presence may be ascertained in various ways. Among these may be mentioned the *polariscope test.* If a urine be levorotary after fermentation with yeast, it is strongly probable that this acid is present. This may be confirmed by means of *Kulz's test.* After fermenting the urine with yeast it is evaporated to a syrupy consistence. An equal volume of concentrated sulphuric acid is then added and the mixture distilled without cooling; alpha-crotonic acid is produced, which is distilled and, after strongly cooling, the distillate is collected in a glass. Crystals which melt at 72° C. separate. If no crystals be obtained, the distillate should be shaken with ether and the melting point tested with the residue, which has been washed with the water obtained after evaporating the ether. (See also Acetonuria, i. 231.)

An important addition to our means of detecting acidosis is Marriott's *alveolar air test* (Jour. Amer. Med. Assoc., May 20, 1916), essentially that of Plesch, as modified by Higgins. It is based on the fact that in acidosis the concentration (tension) of the carbonic acid in the air-cells is diminished. The degree of tension corresponding with that of acidosis, the severity of the latter may be determined. The air (about 600 c.c.) is blown without effort by the patient in a rubber bag about 1500 c.c. capacity. The air thus collected is then run into a solution of 1: 100 normal alkali and phenolphthalein, and the resulting color is compared with the graded colors of the contents of a set of tubes which colors correspond with known quantities of carbonic acid in air. (See original article for details concerning necessary equipment.) The normal carbonic acid tension of an adult being 40 to 45 mm., the test may indicate it to be 30, 25 or 20, usually the lowest limit reached, and which indicates imminent danger. In coma it may reach 10 mm. In infants the normal tension is from 3 to 5 mm. lower than in adults.

P. Roth (Jour. Amer. Med. Assoc., July 31, 1915) uses the *Haldane method,* but secures two samples, both taken alike from a complete expiration following a normal inspiration. The patient breathes through a glass tube into a test-tube containing a few c.c. of alkaline solution of mercuric cyanide and silver nitrate. Acetone gives an opalescent precipitate and is reported simply in terms of "trace," "plus," etc. For collecting samples from patients who are unconscious or from those who cannot co-operate, the following method is satisfactory: The subject breathes normally back and forth for 25 seconds into the same collecting tube used in the Haldane method, with the valve turned so as to connect the patient from the start with the rubber tube. At the end of the period, and as nearly as possible at the end of an expiration, the valve is turned to seal the sample obtained in the rubber tube, from which it is transferred at once into the sample buret. With normal carbon dioxide tension in the alveolar air there is no appreciable acidosis *even with acetone perceptible in the breath.* This means the border line of acidosis, however. A tension below the minimum normal indicates an acidosis proportional to the fall of tension, and tension of 15 to 20 mm. indicates threatened coma. In coma the tension may go as low as 5 or 6 mm. or less until death, when it falls to 0.

Finally, Y. Henderson (Jour. Amer. Med. Assoc., July 25, 1914), found that *inability to hold the breath* at all is a sign of acidosis in its acute stage. The normal period is between 30 and 40 seconds; any period under 20 seconds indicates acidosis.

Prophylaxis.—In *surgical acidosis* prophylactic measures are increasingly being employed. W. B. Russ (Jour. Amer. Med. Assoc., Nov. 1, 1913) holds that many patients suffering from acidosis are unfit subjects for general anesthesia and the ordeal of an operation. The warning signs in such cases are: (1) A history of unaccountable headaches, vertigo, attacks of dyspnea, occasional nausea or vomiting, an unreasonable dread of the operation, tachycardia, and other nervous symptoms. (2) A peculiar sweetish odor to the breath, suggesting the odor of decayed apples. In some cases this is marked and unmistakable. (3) The presence in the urine of the acetone bodies. Referring to the influence of peripheral irritations as a cause of acidosis through the adrenals or chromaffin system, R. T. Morris (Amer. Med., June, 1916), advocates the removal of such conditions as eye-strain, nasal hypertrophies, loose kidneys, hemorrhoids, etc., to enable such patients to withstand the effects of severe surgical work.

Referring to the influence of acidosis on surgical procedures, Lincoln (Annals of Surg., Feb., 1917) urges that surgeons should bear in mind the danger in the preparation of patients for operations of a too prolonged starvation, especially in the case of children or those suffering from any form of exhaustion.

As to preoperative prophylaxis, in 138 consecutive major operations, Quillian (Annals of Surg., Apr., 1916) had no mortality and but 5 cases of shock by resorting to the following prophylactic routine: **Sodium bicarbonate** ʒss (2 Gm.) in one-half glass of water t. i. d. one-half hour before meals, for two days preceding operation. The same salt and **glucose** āā ℥ss (15 Gm.) with water q. s. ad ℥viij (210 c.c.) as a retention enema, b. i. d. for two days preceding operation. **Liquid diet** and large quantities of water for 48 hours preceding operation, but no buttermilk or egg-albumins for 24 hours.

The morning preceding the day of operation castor oil ℥ss (15 Gm.). **Soapsuds enemata** the night preceding, and the morning of, the operation. **Strontium bromide** gr. xxx (2 Gm.) the night preceding operation to insure a good night's rest. **Morphine,** gr. ⅛ (0.008 Gm.), with **scopolamine,** gr. 1/100 (0.0006 Gm.), one hour preceding gas and ether anesthetic.

After operation **sodium bicarbonate,** ʒss (2 Gm.), in one-half glass of water one-half hour after meals for several days. **Water and liquid diet** as soon as nausea ceases, and continued until a light diet is begun on the fourth day. An **eliminant** on the third day after the operation.

Treatment, ii. 271.—In its general lines the indications, besides that of the causative condition, are as stated by McLeave (Jour. Amer. Med. Assoc., Nov. 15, 1913) in the *acidosis of children,* a dietary low in fats with ample amounts of carbohydrate. Citrus, fruit juices, and grape juices are also valuable. Fatigue and undue excitement should be avoided. **Sodium bicarbonate** in 1- to 2- dram (4 to 8 Gm.) doses weekly, and periodic emptying of the large bowel tend to abort the attacks. During the attack sodium bicarbonate can be given in

60-grain (4 Gm.) doses every 3 or 4 hours by mouth or rectum. **Sugar** must be given, preferably dextrose, in 4 per cent. solution with alkali, either by mouth or rectum. **Saline infusions** are given to counteract the loss of fluids by the excessive vomiting, and **opium, chloral,** and the **bromides** to control the nervous manifestations. Blodgett (Amer. Med., June, 1916), who first called attention to the connection between persistent vomiting and acidosis, found that the best way to administer **sodium bicarbonate** was to inject a pint of normal saline solution containing 40 grains (2.6 Gm.) of the salt intramuscularly over the scapula. This can be repeated over the other scapula within an hour. The salt can also be given orally, but experience has caused other observers to discard this method when free emesis occurs. Blodgett found that the cessation of emesis was hastened by giving small amounts of food at a time irrespective of the kind allowed. Howland and Marriott (Amer. Jour. of Dis. of Children, May, 1916) deem a 4 per cent. solution intravenously the method of choice, 75 to 150 c.c. (2½ to 5 ounces), according to the age of the infant, being given and repeated in three hours if the air-hunger does not cease.

In the *acidosis of pregnancy,* H. Williamson (Amer. Med., June, 1916) says that chloroform anesthesia, calomel, and also mercurial douches should be avoided. Intravenous infusion with **sodium bicarbonate** or **sodium acetate** solution should be employed. **Glucose** should be administered so that the fat metabolism may be spared. If acidosis exists in a pregnant woman suffering from chronic nephritis, the uterine cavity should be emptied.

In *operative acidosis,* A. C. Burnham (Amer. Med., June, 1916), recommends as routine treatment: (1) Adequate nutrition by mouth, especially in the form of **carbohydrates;** (2) forced carbohydrate feeding in the form of **glucose** solutions by mouth—a teaspoonful of glucose to a glass of water. It may also be given by rectum, or subcutaneously, an ounce to a quart; (3) **bicarbonate of sodium** solutions given by mouth, rectum or subcutaneously; (4) saline solutions by **hypodermoclysis** during the operation; and (5), **morphine** for the relief of pain and to prevent the evil effects of excessive external stimuli.

ammonia (aromatic spirit) in, ii. 271
enema in, ii. 271
epinephrin in, ii. 271
glycerin in, ii. 271
magnesium sulphate in, ii. 271
rectal transfusion in, ii. 271
saline solution in, ii. 271
sodium bicarbonate in, ii. 271; viii. 192
sodium carbonate in, viii. 192
sodium citrate in, ii. 271; viii. 187, 192
strychnine in, ii. 271
venesection in, ii. 271
in diabetes, iv. 24
Acne, i. 256

Etiology, i. 258.—There is still considerable diversity of opinion as to the bacterial etiology of acne. According to M. Haase (Jour. Amer. Med. Assoc., Aug. 17, 1912), 3 forms of micro-organisms, constantly present in the comedo, are admitted by investigators, namely, a small bacillus, a coccus, and a mysterious germ known as the bottle bacillus which from its occurrence elsewhere, etc., is discarded, as having no influence on the disease. The coccus until recently was classed as one of the staphylococcus group, but Kraus (Archiv f. Derm. u. Syph., July, 1913) found that this so-called bottle bacillus first described by Unna, had in association with it a large number of transitional forms of the same organism, some of which resembled or were identical with the threads of a mycelial fungus. His studies led to the conclusions, therefore, that the organisms classed under the heading "bottle bacilli" are probably not bacilli of one type, but pleomorphic varieties of several kinds; that some "bottle bacilli" appear to be true moulds, and finally, that other forms would seem to be sporoidal elements of mycelial fungi. On the other hand, E. D. Chipman (Jour. Amer. Med. Assoc., Feb. 22, 1913) found that bacteria may be ignored as an etiological factor in acne unless occlusion of the sebaceous ducts is present. Except in the treatment of acne by vaccines the bacteriological flora is of no importance.

The etiological participation of gastrointestinal disorders in acne vulgaris are receiving due attention. While, according to L. W. Ketron and J. H. King (Jour. Amer. Med. Assoc., Aug. 26, 1916) the acne bacillus is generally recognized as the direct cause of acne vulgaris, a number of associated conditions probably act as predisposing factors, among which gastrointestinal abnormalities seem of special importance. They investigated the problem in 30 cases by means of fluoroscopic examination of the gastrointestinal tract, test meals, and analyses of the gastric contents. It was found that 93 per cent. showed gastric abnormalities and 70 per cent. intestinal abnormalities. The most common gastric findings were hyperacidity, 48.1 per cent.; retention, 36.6 per cent.; atony, 33.3 per cent., and ptosis, 40 per cent. The most common intestinal findings were cecal stasis, 46.6 per cent.; ptosis of the colon, 36.6 per cent., and right lower quadrant adhesions, 23.3 per cent. Clinically, 62.3 per cent. of the cases gave evidence of gastric disturbances and 40 per cent. were constipated. None of the cases examined gave entirely normal gastrointestinal findings, and 60 per cent. showed abnormalities which were of such a nature as to permit gastric and intestinal stasis, followed by toxic absorption.

[The confusion concerning the pathogenesis of acne is due, in my opinion, to the fact that the *ductless glands* are overlooked in the morbid process. As I pointed out in 1914 before the Manhattan Dermatological Society of New York, a close relationship suggests itself when these structures are accepted as active participants in the morbid process. At puberty we encounter the period when the thymus has ceased to furnish its nucleins. Many of the disorders of adolescence may be traced to this cause. Development has ceased, and the other or permanent ductless glands whether ready or not, must sustain the life process without the thymus. The pancreas, thyroid and adrenals maintain not only the nutritional processes of the body, oxidation and metabolism, but simultaneously its defensive process. When we realize that they do this while carrying out the catabolic phase of metabolism, and as a part of this process, breaking down poisons, toxins, etc., as they do normal wastes, the apparent complexity of the immunizing process disappears. Nevertheless, upon the integrity of these two connected functions depends the health of the whole.

Many other facts submitted at the time suggest that acne may be due to inadequate defensive activity of the body through insufficiency, inherited or acquired, of one or more of the ductless glands, which not only from my viewpoint nowadays, but from that of others, take part in this general defensive process. We have indirect proof of deficient immunizing power as a cause in the effectiveness in many cases of acne, of **staphylococcus vaccine**, which though not specific, nevertheless provokes the formation of antibodies. **Thyroid gland** with **pituitary** or **ovarian gland** is also effective in hypothyroidism, especially hypothermia are discernible.

When, as stated above, gastrointestinal disorders exist in the case, the resulting autointoxication aggravates and may doubtless cause the disease, owing to the deficient antitoxic activity of the blood, due in turn to the deficient activity of the ductless glands. C. E. de M. S.].

acne bacillus in, i. 267
actinic lamp in, i. 266
adrenalin in, i. 774
alcohol in, i. 262, 264
alkalies in, i. 261
almond-oil emulsion in, i. 263
alumnol in, i. 591
aperients in, i. 261
arsenic in, i. 261; ii. 142
arsenic bromide in, i. 261
atoxyl in, ii. 262
bay rum in, i. 262
benzoin tincture in, i. 262
betanaphthol in, i. 262
Bier's hyperemia in, i. 266; v. 599
bismuth subnitrate in, i. 263, 474
borax in, i. 262, 264
boric acid in, i. 262

Buchholtz (Berl. klin. Woch., Feb. 2, 1914) in a number of cases of obstinate acne obtained excellent results from rubbing into the skin a powder consisting of equal parts **yeast and boric acid**, after the skin has been softened by thoroughly rubbing in a thin layer of boric acid salve. One treatment a day sufficed. A powder composed of 2 parts yeast to 1 of boric acid sometimes proved more effective.

cacodylates in, ii. 705
cajuput oil in, ii. 709
calcium sulphide, liquor, in, i. 264; viii. 430
calomel in, i. 261
camphor in, i. 264
camphorated alcohol in, i. 262
carbolic acid in, i. 264
cascara sagrada in, i. 261
chrysarobin in, iii. 339
codliver oil in, i. 261
cold douches in, viii. 811
colocynth in, i. 261
cologne water in, i. 262, 264
creolin in, i. 262
creosote in, iii. 688
curette in, i. 263, 265
electrolysis in, i. 264
formaldehyde in, i. 263
friction in, i. 265
green soap in, i. 261, 262
hot water in, i. 262, 263
hydrochloric acid in, v. 557
ichthyol in, i. 261, 264; v. 638

McDonnell (Jour. of Cutaneous Dis. Feb., 1917) holds that the true cause of acne is intestinal fermentation. In addition to **appropriate diet** he gives **aloin** gr. 1½ (0.10 Gm.) **ichthyol** 2½ drachms (10 Gm.) and liquorice powder q. s. to make 30 capsules, one of which is given after each meal.

iodides in, vi. 30
iron citrate in, i. 261
jalap in, i. 261
lancing in, i. 265
magnesium sulphate in, i. 261
massage in, i. 263, 265
mercurial plaster in, i. 265
mercurial preparations in, i. 261, 262, 263, 264
mercury (ammoniated) ointment in, i. 263
mercury bichloride in, i. 261, 262, 264
mercury cyanide in, i. 264
mercury, red oxide of, in, vi. 672
mercury, yellow oxide of, in, vi. 672
naphthol in, i. 264
nux vomica in, vii. 149
opsonic method in, i. 263
outdoor exercise in, i. 261
ovarian extract in, i. 788
potassium acetate in, i. 261
potassium-mercuric iodide in, vii. 584
potassium polysulphide in, i. 263
potassium sulphide in, viii. 431
potassium sulphuret in, i. 261, 262, 263
quinine in, iii. 390
resorcin in, i. 261, 262, 264, 265
rose-water ointment in, i. 261
rumex in, i. 261
salicylic acid in, i. 261, 262, 264, 265; viii. 48
soap in, i. 263
spermin in, i. 785
Startin's solution in, i. 261
strychnine in, i. 261
sulphur in, i. 261, 262, 263, 264, 265; viii. 430

Kromayer (Deut. med. Woch., Oct. 9, 1913) recommends **sulphur** as the best agent to keep the bowels open. He orders equal parts of precipitated sulphur and sugar of milk; the patient swallows several times a day as much as will be held on the tip of a penknife. Long experience has shown that the sulphur, besides stimulating peristalsis, checks putrefaction in the bowels and thus removes the autointoxication maintaining the irritation in the sebaceous glands. He also regards sulphur as the most effective local measure and has the pustules painted at night with a mixture of 10 parts of sulphur, 25 parts of alcohol, and 5 parts of glycerin.

sulphur ointment in, i. 261, 264; viii. 430
sulphur soap in, i. 262, 264
sulphur waters in, vi. 709
sulphuric acid in, viii. 432
tar ointment in, viii. 502
thiosinamine in, viii. 530
thymol in, viii. 533
vaccines in, i. 263, 266, 267, 268; ii. 405

According to Sibley (Clinical Jour., Apr. 29, 1914), severe cases of acne often do better under vaccine treatment than comparatively mild ones; the most resistant to this treatment are usually those with abundant seborrhea, many comedones, and scanty foci of suppuration. Vaccine treatment must be continued for 6 months at least, and long after all spots have ceased to appear, when diminishing doses at longer intervals will often prevent relapses and complete a cure.

Rebellious cases of acne were scarcely influenced by the vaccine in cases treated by Spillman and Zuber (Progrès méd., Apr. 11, 1914), except that pustular lesions became much smaller, less numerous, and more evanescent after the treatment.

In Cornell University, H. H. Fox (Jour. Amer. Med. Assoc., June 24, 1916) found that entering students showed 30.2 per cent. of the freshman class suffered from acne vulgaris; general in 17.8 per cent., and limited to the face in 12.2 per cent. Their treatment showed the superiority of well-known therapeutic measures over vaccine therapy. Indeed, T. J. Horder has well said: "The failures of vaccine therapy are probably more numerous than its successes."

Acne (*continued*).
Vleminckx's solution in, i. 264
X-ray in, i. 262, 263, 265, 266

In the majority of cases repeated small doses of **X-rays** will bring about a satisfactory cure, according to Sibley (Clinical Jour., Apr. 29, 1914), even when all other treatments have completely failed. A third of a Sabouraud's pastille dose repeated at the end of a week, and then after fourteen days, is the system was found to agree best in most cases. After this it is often desirable to keep up the effect of the rays for a considerable time, at three weeks' to a month's interval, between applications.

Dosseker (Therap. Monats., Aug., 1915) says that repeated small doses of the X-rays not strong enough to induce appreciable reaction in the skin, or a single large dose with a reaction, seem to be able to modify the sebaceous glands to such an extent that the tendency to acne dies out. This proved true in a large number of cases. Its efficacy is greater in acne spread over a larger surface, with numerous pustules, than in the less disfiguring, torpid type.

Le Févre (Ohio State Jour. of Med., Feb., 1917) finds dietetic measures unnecessary. He removes all oil excess by **pure alcohol cleansing** of the face, the **copious water drinking** and **X-ray** 5 minutes to each side once a week, or if erythema occurs every other week.

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Aconite, i. 274
  therapeutics, i. 274

Rudolph and Cole (Amer. Jour. Med. Sci., Dec., 1912) found experimentally that small doses of aconite have no apparent effect upon the pulse rate, even when the drug is active. If dangerous effects have followed small medicinal doses, as has been occasionally reported, they have been due either to some mistake in the dispensing or administration, the patient receiving far more than was intended. Or, an idiosyncrasy may have existed, toxic effects following a dose which ordinarily would have had no effect.

A. D. Bush (N. Y. Med. Jour., Jan. 22, 1916) states that in some patients, and under some conditions of acute infection, like that of acute bronchitis, the reaction of the system is almost violent. The temperature of the patient rises rapidly to 104° F. (40° C.) or higher, the heart beats with greatly increased vigor and frequency, there is a full pulse of high tension, a considerable rise in blood-pressure, and an acceleration of respiratory activity. So sharp is the attack of the invading organism, and so vigorous the reaction of the system, that for the time being there seems actual danger of nature overstepping herself and creating mischief through excessive activity. It is in such cases that some external regulating influence seems advisable. In such reactions aconite is the only drug whose pharmacological provings show a true indication.

W. Hanna Thomson (Amer. Jour. Med. Sci., Jan., 1915) holds that aconite is the most efficacious vasodilator when given sytematically in full doses. Aconite thus administered at once reduces blood-pressure, produces a full and compressible pulse, and greatly increases the percentage of the elimination of urea in interstitial nephritis. He prefers it to all nitrites, as their vasodilating effects are too transient, the most prolonged of them, that of the erythrol tetranitrate, lasting for less than an hour, which is by no means sufficient for such a permanent morbid condition of general arterial contraction, with heightened blood-pressure, as is present in chronic interstitial nephritis. The most important action of aconite when administered in interstitial nephritis is to increase the elimination of urea.

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  ammonia (aromatic spirit) in, i. 281
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  alteratives in, v. 690
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Acrocephaly, see Oscycephaly, this Index.
Acrocyanosis, see Acroparesthesia, viii, 791
Acromegaly, i. 285

Diagnosis and Pathogenesis, I.—If we concede that pituitary secretion causes the disease we must endow this secretion with the power to provoke practically all the other ductless gland disorders, whether sthenic or asthenic, observed in acromegaly. Thus in a case observed by Claue and Baudouin (Hospital, July 29, 1911) in a woman of 25 years, the classic symptoms of acromegaly successively appeared: hypertrophy of the hands, feet, and face, cervico-dorsal kyphosis, macroglossia, etc. For 10 years the arterial pressure was raised, amounting to 26 cm. and 28 of mercury. At the same time this patient showed all the signs of Graves's disease, exophthalmos, tachycardia, tremors, and pulsating goiter. Toward the end she was affected with marked asthenia, confining her to her bed. The symptoms, therefore, suggested what the authors term "a complete anarchy of the internal secreting glands," the pituitary, suprarenals, and thyroid all functioning in excess, while the suppression of menstruation suggested the cessation of ovarian function as the *primum movens* of the whole condition. At the autopsy, a voluminous tumor of the pituitary body was found, weighing 48 grams. All the other internal secreting glands were hypertrophied and in a state of hypersecretion. The ovaries were atrophied. The hemolymphatic organs (spleen, lymphatic glands, etc.) were also hypertrophied. W. B. Weidler (Boston Med. and Surg. Jour., Apr. 6, 1916) described a typical case in which an extreme degree of exophthalmos existed along with the von Graefe, Dalrymple, Stellwag and Gifford signs of Graves's disease. On the other hand, we find L. Millioni (Riforma medica, xxix, No. 38-40-41, 1913) reporting a case of acromegaly which showed typical manifestations of myxedema. Thyroid treatment brought about improvement, the skin becoming thinner and the patient losing weight. He considers both pituitary and thyroid insufficiency to have been present in this case. Finally, a case of acromegaly was reported by J. L. Bendell (Albany Med. Annals, Sept., 1915) with a "polyglandular syndrome" as the authors describe it. The right lobe of the thyroid showed a distinct enlargement of the colloid type and non-adherent; adrenal involvement suggested by a brownish macular discoloration of the face and arms and asthenia.

[These phenomena are all acaccounted for by the functions I attributed to the pituitary years ago (1903-1907) which the misleading secretion theory has unfortunately overshadowed, even though, as Biedl states (Internal Secretory Glands, p. 349, 1913) "we possess no proof of any kind that the active substance present in pituitary extract is formed in the organ during life and by it passed on into the blood-stream." It will be recalled that from viewpoint it is through the ductless glands, the functions of which it co-ordinates through sympathetic nerves, passing down through the basal tissues (revealed mainly by histological methods) the bulb, cord, etc., that the pituitary supplies the blood with secretory products—those of the glands it excites. Hence the hyperplasia, hypertrophy of these vary in acromegaly, but which occurs only during what I have termed the *erethic* stage of the disease and the presence of symptoms of Graves's disease, with bone growth owing to enhanced calcium metabolism (of parathyroid origin) and of muscular hypertrophy the familiar expression of excessive adrenal activity as shown in adrenal hypernephroma. When we turn to the *sthenic* stage of the disease, the previously overstimulated thyroid apparatus and adrenals are no longer stimulated to even normal activity. So marked is the deficiency often as to cause myxedema and Addison's disease, as in the cases recorded above, which are but examples of a large number in the literature of the subject. C. E. de M. S.].

Other facts tend to invalidate the prevailing belief that the pituitary body is a secreting gland. Thus, Lacaille (Bulletin de la Soc. de Méd. de Paris, April 10, 1914) observed 3 cases of *unilateral* acromegaly. The sella turcica examined antero-posteriorly by X-ray showed that one side, that opposite to the enlarged extremities and facial deformities, was larger than the other side, suggesting that the pituitary gland of the same side was also enlarged. This suggests a neuropathic disorder, since the influence of decessation here is necessary to account for the morbid phenomena witnessed.

[As I likewise urged long ago, the nervous mechanism referred to above does not only co-ordinate the functions of the thyroid apparatus and adrenals but also among other structures the caliber of the arterioles—throughout the body. We can thus understand the possibility of unilateral acromegaly since a unilateral growth of the pituitary can thus stimulate excessively and overnourish the side of the body to which its overactive nuclei transmits correspondingly violent impulses with overnutrition of the tissues as result. C. E. de M. S.]

The neurogenic rôle of the pituitary is shown in other directions. L. J. Genella (N. O. Med. and Surg. Jour., Aug., 1913) reports a case which for a time presented the clinical picture of paresis, after which, preceded by persistent neuralgia, there occurred a gradual enlargement of the patient's right hand and foot, followed, within 3 months, by similar growth of the left hand and foot. There was no enlargement about the jaws.

Schultze and Fisher (Mitteil. a. d. Granz. d. Med. u. Chir., xxiv, Nos. 4-5, 1912) observed a case of acromegaly and hypertrophic osteoarthropathy. The patient was a girl of 15 in whom a pituitary tumor caused acromegaly and partial obesity. The first symptoms had been observed at 11. In a second case, a man of 56, the patient complained of gastric symptoms since receiving a contusion of the region 7 years before. Acromegaly developed and a pituitary tumor was found at autopsy. The adrenals in both cases were enormously enlarged, *i.e.,* to five times their normal size, all the viscera having grown to unusual size.

The acromegalic process may proceed for a while and cease. H. Schlesinger (Lyon Méd., Dec. 1, 1912) reported the case of a man of 59 years who had had the acromegalic aspect since his youth. He showed no ocular symptoms, but persistent diabetes of moderate intensity finally led to coma. At the autopsy a very small adenoma on the pituitary was found, thus accounting for the absence of all ocular phenomena.

[A careful study of the facies, particularly the conformation of the nose and chin—those of the Punch type—will soon show that cases of arrested acromegaly, often incited by children's febrile diseases, are not uncommon. C. E. de M. S.].

A close functional relationship is known to exist between the pituitary and the genital organs. K. Goldstein (Münch. med. Woch., Apr. 8, 1913) observed a case of acromegaly following panhysterectomy. At the age of 39, the woman had been operated for uterine fibromyosa and a tumor of the adnexa, both the latter and the uterus being removed. The menses accordingly ceased. About a year after the operation the hands and feet began to grow larger, the face broadened, the lower jaw became markedly prominent, and the body weight showed a considerable increase. There were no serious cerebral symptoms or visual disturbances.

During pregnancy the hypophysis also shows signs of increased activity. Mild changes, such as coarsening of the nose and lips, are not uncommon, but a well developed complex, such as one reported by R. Marek (Zentralbl. f. Gynäk., Nov. 25, 1911) in which true acromegaly followed pregnancy but retrogressed after labor, is of extreme rarity.

Salle (Jahrb. f. Kinderheilk., May, 1912) reports the clinical history and autopsy findings of a case of acromegaly in a newborn infant. The child measured 58 cm. at birth and weighed 3,125 grams, but its hands were 7.5 cm. and its feet 10.6 cm. long, the middle finger 4.5 cm. and the big toe 3.4. The nose, chin, and tongue were also abnormally large; the hypophysis was deformed from the pressure of a bulging portion in the base of the skull. The irritation from this had probably induced hyperactivity of the pituitary.

Violent emotions are frequently the cause of disorders of the ductless glands. In the case of a woman of 24 years, reported by Briquet (Presse méd., Sept. 11, 1912), acromegaly had developed abruptly 6 years before as the result of a fright, in association with total suppression of the menses.

Pathology.—A distinct retention of calcium, magnesium and phosphorus was noted by Bergeim, Stewart and Hawk (Jour. Exper. Med., Sept., 1914). It was not accompanied by corresponding changes in general metabolism as evidenced by a practical balance of nitrogen and sulphur. A. W. M. Ellis (Jour. Amer. Med. Assoc., June 24, 1911) found in a female patient suffering from typical and well-marked acromegaly of 4 years' duration, a constant excretion of creatin, ranging from 52 to 500 mg., the average being between 100 and 150 mg. a day. This case is interesting in view of the recent findings by Krause of a constant excretion of creatin in human diabetes mellitus and in phloridzin glycosuria in dogs.

Analysis of a personal and similar case convinced G. Kahlmeter (Hygiea, lxxviii, No. 10, 1916) that pituitary tumors of the adenoma type, with cells which do not take the acid stains, do not induce a tendency to acromegaly, while acromegaly is practically a constant accompaniment of such tumors when they are of an acidophile structure.

arsenic in, i. 325
ergot in, i. 326
iodine in, i. 325
iron in, i. 325
ovarian substance in, i. 326

In a case with obesity, amenorrhea and ataxia, L. Kalledey (Zentralbl. f. Gynnäk., July 12, 1913) used intravenous injections of ovarian extract. After 6 injections the ataxia was markedly improved; after the sixteenth injection the patient walked without any difficulty. Two months after the beginning of treatment the patient had scanty menses, which was followed one month later by a copious flow of 6 days' duration. She lost about 18 pounds during this time. Pregnancy occurred.

pituitary substance in, i. 326, 777
removal of pituitary in, i. 327

[Removal of the diseased pituitary is now accomplished by methods, reviewed under Pituitary, Tumors of, this Index, which afford a relatively low mortality. Yet it should not be forgotten that abnormal sensitiveness to intoxication and infection has been noted. Any remedy indicated in such patients should, therefore, be given in very small doses at first to test their affects. J. A. Flexner (Louisville Mo. Jour., May, 1912) referring to a personal case, in which death had occurred after a heavy supper, alludes to "the extreme susceptibility of these patients to morphine and to autointoxication especially of purin cases," stating that 1/24 grain (0.0027 Gm.) of heroin kept the patient, a woman, narcotized for over a day. Physiologists have also observed, though overlooking its meaning, that a large proportion of animals die of some intercurrent infection soon after removal of their pituitary. Gemelli as far back as 1908 laid stress on the antitoxic power of the organ. Aschner (Alienist and Neurologist, May, 1913) also refers to a decrease of the general power of resistance in such animals. These facts sustain my opinion (1903) that the pituitary through the nervous connections referred to above, with the thyroid, adrenals and other organs, takes part in the defensive functions of the body. When, however, as in acromegaly, the organ is the seat of organic lesions, the co-ordinating impulses to the various defensive glands are increasingly assumed by secondary centers in the mesencephalon and bulb, and, the resistance to infection and intoxication, endogenous or exogenous, is more or less maintained. It is because of this assumption of functions by lower nuclei that a diseased pituitary can be removed in advanced cases of acromegaly, pituitary tumors, etc., without giving rise to serious after-symptoms. Were the pituitary the source of a physiological secretion, this could not be the case. C. E. de M. S.]

thyroid gland in, i. 326, 710, 729

In a case of acromegaly with psychic disturbances described by Salo-

mon (Presse méd., Dec. 13, 1913), all the symptoms became considerably worse while the patient took pituitary extract, whereas the administration of a **thyroid** preparation instead coincided with disappearance of the headache, dizziness, and vomiting, and an improvement in the mental state. Renewed pituitary treatment caused all these symptoms to reappear, after which they yielded again to thyroid treatment.

X-ray in, viii. 828

Acromion, fracture of, iv. 765

Acroparesthesia, viii. 791

Treatment.—As specified in the article on acroparesthesia the treatment is the same as for Raynaud's disease; hence the fact that the following list refers to agents given under the latter heading throughout the general volumes.

amyl nitrite in, viii. 789
baths, radiant heat, in, viii. 789
baths, warm, in, viii. 789
Bier's hyperemia in, v. 594, 595
climate in, viii. 789
collodion, flexible, in, viii. 789
electricity in, viii. 789, 790
elimination of external cause in, viii. 792
erythrol-tetranitrate in, iv. 600
hot air in, viii. 789
ichthyol in, vii. 789
massage in, viii. 790
nitrates in, vii. 55
nitroglycerin in, viii. 789
nitrous ether, spirit of, in, viii. 789
quinine in, iii. 388
sodium bromide in, viii. 789
sodium iodide in, viii. 789
thyroid gland in, viii. 789
tourniquet in, viii. 790
warm poultice in, viii. 789

Actinomycosis, i. 333

Diagnosis, i. 338.—Cope (Brit. Jour. of Surg., July, 1915) urges that actinomycosis should always be considered in the diagnosis in the case of any newly formed subacute or chronic swelling in the region of the mouth, face, neck, thorax, or right side of the abdomen. Pus from every abscess should be examined as a routine practice. In any subacute or chronic lesion, the discharge needs to be examined repeatedly. Peribuccal infections comprise the majority of the cases. Holland (Norsk Mag. f. Laegevid., Aug., 1913) adds a third to the two cases previously published in Norway of primary invasion of the skin by the actinomyces. Primary actinomycosis of the salivary glands has been considered a rarity. G. Soderlund (Nord. med. Ark., xlvi. No. 4, 1914) has found that a primary actinomycosis infection of all salivary glands can take place and that the disease in the early stage has a definite clinical as well as pathologic picture. In a relatively short time he observed 9 primary cases. Eight of these were very early cases of primary actinomycosis of the salivary glands. Altogether he reports 31 cases, 7 of which originated from the submaxillary gland. The infection entered positively by the duct route in some of the cases and probably in the others also, the patient chewing a stem of grain bearing the actinomycotic organism. Three different stages are observed: a diffuse inflammatory process, a localized abscess, and a spreading abscess within the gland, eventually forming new abscesses and finally breaking through with the formation of fistulæ, either external or internal.

Etiology, i. 339.—The true cause was found by E. G. Dresel (Deut. med. Woch., Oct. 15, 1914) to be an anaerobic trichomycete, but in many cases there was a mixed infection with a form of streptothrix which belongs to the same general class and which has often been confounded with the former Certain human infections are encountered which are clinically actinomycosis, but which are due to purely aerobic streptothrices.

The only available means of accurate diagnosis of true actinomycosis lies in bacterial culture examination of the pus from the lesion.

Prognosis, i. 344.—In a series of 87 cases described by Harbitz and Grondahl (Amer. Jour. Med. Sci., Sept., 1911), the lesions were distributed as follows: 45 per cent. of the cases occurred on the neck and face (all were cured); 23 per cent. in the lung (all died); 30 per cent. in the abdomen (19 died and 5 were cured); 3 per cent. on the skin (1 died and 1 recovered).

carbolic acid in, i. 345; vii, 443
cauterization in, i. 346
copper sulphate in, i. 345
electrotechnical treatment of, i. 346
eucalyptus in, i. 345
excision and iodide in, i. 346
hot compresses in, i. 345
hydrogen dioxide in, i. 345
incisions in, i. 346
iodides in, i. 344, 345, 346; vi. 24

Treatment, i. 344.—Slattery (Lancet, Oct. 19, 1912) describes 3 cases, 2 of the lung and 1 of the cervical glands, in which actinomycosis developed in patients with active tuberculosis. The exhibition of large and increasing doses of **potassium iodide** led to a cure of the condition in all three.

In acute actinomycosis of the parotid gland E. D. Telford (Brit. Med. Jour., Oct. 9, 1915) considers that incision alone will not cure the condition; there should also be given large doses of **potassium iodide** and a 10 per cent. solution of **iodin** may be injected into the region of the lesion. **Irrigation** of the incisions and sinuses with diluted tincture of iodine is also of value. Both cases were treated in this manner and recovery was fairly prompt with little scarring.

iodine in, i. 345
iodoform gauze in, i. 345, 346
phenol in, i. 345; vii. 443
potassium permanganate in, i. 345
puncture in, i. 346

H. E. Brunzel (Strahlentherap., vi., 1915) reports a case of Heierdahl's in which 4 cg. (⅔ grain) of pure radium were applied for 3 days to an actinomycosis beneath the right eye; there was complete cure in 2 months.

resection in, i. 346
sodium cacodylate in, i. 346

Many cases remain uncured no matter what is done. Such a severe case was treated by Bittner and Toman (Prog. med. Woch., Nu. 27, 1913) with daily subcutaneous injections of **sodium cacodylate**, beginning with 1½ grains (0.1 Gm.), increasing to 15 grains (1 Gm.) and then again decreasing. The infiltrated mass was incised and into the surrounding 25 per cent. **iodipin** was injected twice, the second injection being given 2 weeks after the first. In a few months the wound was completely healed with hardly a scar.

surgical measures in, i. 346
X-ray in, i. 345

R. Levy (Zentralbl. f. Chir., Jan. 25, 1913) reports 2 cases in which actinomycosis was apparently cured by irradiation. The second patient had been operated on repeatedly, undergoing about a year previously a partial resection of the upper jaw. The infiltrate disappeared completely under **X-ray** treatment alone and the fistula closed.

of the pharynx, see Pharynx, Actinomycosis of, vii. 431; also this Index.
thyroiditis, chronic, of, viii. 559
Actinotherapy, see Light Therapy, vi. 356
Actol, i. 347
Acupuncture, i. 347
Acute rhinitis, i. 347

Etiology, i. 349.—Differences of opinion continue to exist as to the relative importance of bacterial infection and weakened systemic or local conditions in the causation of coryza. It will readily be admitted with Leonard Hill and F. F. Muecke (Lancet, May 10, 1913) that in a moist, warm atmosphere, the turgid mucosa will become covered with a thick secretion and the latter, in turn, massively infected with bacteria if the room be crowded. Upon chilling, the locally defensive ciliary action, phagocytosis, etc., being in abeyance, the bacteria pullulate. A. Parker Hitchens (Penna. Med. Jour., May, 1913) writes of the bacteria always present in the respiratory tract as a result of local venous stasis from any cause, while Hagemann (Med. Rec., Feb. 14, 1914) inclines to the theory of the nasal mucosæ in coryza as eliminators of substances resulting from faulty metabolism.

From the bacteriological standpoint Tunnicliffe (Jour. Amer. Med. Assoc., June 28, 1913) has discovered in acute and chronic rhinitis a Gram-negative anaerobic organism (*Bacillus rhinitis*), which he claims to be the exciting cause in at least some cases of coryza On the other hand, G. B. Foster, Jr. (Jour. Amer. Med. Assoc., Apr. 15, 1916) has performed experiments strongly suggesting that the causative virus is ultramicroscopic and filterable, the clear filtrate obtained from passage of diluted coryzal secretions through a Berkefeld N filter, and even subcultures from this filtrate, causing rhinitis when dropped into the nostrils of healthy subjects.

Prophylaxis, i. 352.—The procedures recommended reflect the varying theories of pathogenesis. A. Jacobi (N. Y. Med. Jour., Mar. 16, 1912) endorses well known hygienic measures of prophylaxis, advising **cold sponging** or **cold baths** to exercise the reactive powers of the skin. Maintenance of general health is itself effectual. A. P. Hitchens (Penna. Med. Jour., May, 1913) advises a mixed **bacterial vaccine**.

abundance of water in, i. 352
acetanilide in, i. 227
acetic acid in, i. 230
acetphenetidin in, i. 252
aconite in, i. 283, 284
adrenal gland in, i. 353
albolene in, i. 355
alum in, i. 354, 584, 588
ammonia, aromatic spirit of, in, viii. 57
ammonium acetate in, i. 615
ammonium carbonate in, i. 617

Acute rhinitis (*continued*).
ammonium chloride in, i. 620
antipyrin in, i. 353; ii. 45
arsenous acid in, i. 355
aspirin in, ii. 220

Some find this drug of value to arrest colds in their incipiency. Sick (Münch. med. Woch., July 16, 1912) reports that one or two 1-Gm. (15 grain) doses, taken at the first indication of a cold, will arrest it, especially when the first tickling in the throat is felt toward evening.

atropine sulphate in, i. 355; ii. 445
bacterial vaccines in, ii. 400
belladonna in, viii. 57
Bier's hyperemia in, v. 596, 597
bismuth subnitrate in, i. 354
boric acid in, i. 354, 355
calomel in, i. 354
camphor in, i. 354, 355; ii. 732
camphoric acid in, ii. 732
catharsis in, i. 353
chloroform in, i. 355
chloroform water in, viii. 57
cocaine in, i. 353; iii. 482

This agent, used with due care, is highly recommended by N. P. Stauffer (N. Y. Med. Jour., Mar. 28, 1914) for local use, both in the stage of profuse discharge, when a 1 per cent. solution of **cocaine hydrochloride** should be applied once daily *by the physician himself,* and in cases in which sinus involvement is suspected, when a 1 to 2 per cent. solution may be used with special attention to the sinus ostia. Douching the nose with a **warm saline solution** should follow. In the suspected sinus cases **rest in bed** and icebags constantly applied to the face, as well as **calomel** and **saline purges**, also help materially.

cold bathing in, i. 352
cubeb in, iii. 711
diet in, i. 352, 355
Dobell's solution in, i. 354
Dover's powder in, i. 353, 354
eucalyptus in, i. 355
exercises in, i. 353

In the vasomotor type of coryza, due to exposure, F. P. Smart (Va. Med. Semi-Mthly, May 26, 1916) asserts that when one is feeling one is taking a fresh cold, the best preventive is to engage in a little vigorous exercise or, if this be not practicable, to take a number of deep respirations in rapid succession.

gelsemium in, v. 18
glycerin in, v. 30
glycothymoline in, i. 354
hamamelis in, i. 355; v. 161
hexamethylenamine in, v. 528, 529
hot lemonade in, i. 353
iodine glycerole in, vi. 7
iodine inhalations in, vi. 39
light therapy in, vi. 361
menthol in, i. 354, 355; vi. 650
morphine in, vii. 188, 189
morphine hydrochloride in, i. 354
morphine sulphate in, i. 355
mustard foot-bath in, i. 352
naphthol-camphor in, vi. 787
opium in, vii. 188
peppermint spirit in, i. 354
potassium iodide in, vii. 584
potassium sozoiodolate in, vii. 585
pyrogallol in, i. 353

According to von Stein (Monthly Cyclo., Dec., 1912), painting the nasal mucosa with a 1:20,000 to 1:1000 solution of **oxidized pyrogallol** causes prompt contraction of the mucous membrane of the turbinates.

quinine in, i. 353, 355; iii. 383
reduction of food in, i. 352
salicylic acid in, i. 354
salol in, i. 354
salt solution in, i. 354
Seiler's tablets in, i. 354
sodium benzoate in, ii. 455
sodium bicarbonate in, viii. 191
sodium salicylate in, i. 354, 356; viii. 57
sodium sulphide in, i. 353

Where obstinate coryza results from chemical irritation of the mucous membranes, G. Laurens (Jour. de méd. de Paris, May 3, 1916) recommends the following solution:—

℞	*Sodii sulphidi* ..	gr. lxxx (75 Gm.).
	Glycerini	℥iiss (75 Gm.).
	Aquæ destillatæ.	ℨvj (25 Gm.).

M.

The solution is used as nasal douche twice a day, one teaspoonful of it being placed in a quart (liter) of normal saline solution

strychnine in, i. 353, 355
suprarenal gland in, i. 353. See Adrenal Gland, above.
tannic acid in, i. 354
tonics in, i. 353
vaccine therapy in, i. 353; ii. 400

Vaccines are held by some specific in both acute and chronic rhinitis, aborting or shortening already incipient acute colds, and also acting prophylactically. According to J. W. Fisher (Boston Med. and Surg. Jour., June 5, 1913), the immunity obtained lasts, on the average, from four to six months. In those subject to recurrent colds in winter an **autogenous vaccine** should be made from the first cold, to which may be added other stock "cold germs": staphylococcus, 400 to 800 million as the full dose; pneumococcus, M. catarrhalis, and M. tetragenus, of each 125 million; B. influenza, B. septus, and B. Friedländer, of each 100 million; and streptococcus, 50 million. Eight minims (0.5 c.c.) of the vaccine should contain the required number of sterile germs. The vaccine is given in increasing dosage at weekly intervals until four to six doses have been administered.

vaselin in, i. 355
vigorous exercise in, i. 352
zinc stearate in, i. 355
Adams-Stokes's disease, v. 232, 343; see also Heart-block, this Index.
Addison's disease, i. 356

The increasing interest in the ductless glands has caused this disease to receive unusual attention in recent years.

[A feature which must be deplored, however, is that some writers upon the subject do not familiarize themselves sufficiently with the diseases of the adrenals to interpret their cases correctly. Several patients showing asthenia and some discoloration of the skin have been reported as cases of Addison's disease which were not such. In one instance, for example, a remarkable recovery is reported in which an acute infection, by exhausting temporarily the adrenals, caused pigmentation, low blood-pressure, etc., all resulting from acute hypoadrenia—a condition from which prompt recovery is usual. In another instance, a basal tumor involving the nuclei of the third pair and the caudate paths, is published as a case of Addison's disease merely because bronzing occurs as one of the symptoms, owing to involvement of nerve paths to the adrenals, etc. Many symptoms due to the tumor, pressure, etc., are thus erroneously made to appear as belonging to the Addisonian syndrome. This is mainly due to the fact that textbook authors still omit the consideration of various disorder of the ductless glands, and thus mislead their readers by omission. C. E. de M. S.]

Diagnosis.—In children the general symptoms are similar to those in adults, although most cases run a very acute course; the pigmentation is less obvious, and death from coma and convulsions occurs more frequently. In a case reported by Langmead (Lancet, Feb. 15, 1913), occurring in a boy, aged 10 years, pigmentation had begun about 1 year before, and attacks of diarrhea with increasing weakness had followed. The boy's father, two aunts and an uncle died of tuberculosis. The symptoms of the last attack were abrupt vomiting, restlessness, unconsciousness, flexed elbows, wrists and knees, subnormal temperature, and frequent convulsive seizures. The suprarenal glands were fibrocaseous throughout. Caseous foci were found in the portal fissure and the lowest lobes of the lungs. Microscopically, giantcells and tubercle-bacilli were found.

The thymus, tonsils, the lymphatic follicles of the tongue and intestines and mesenteric glands were hyperplastic. The heart weighed only 3 ounces, the small size being no doubt due to the accompanying weakness and the low blood-pressure.

[The small size of the heart here is due to insufficiency of the adrenal secretion, which sustains its contractile activity, directly as to the right heart, and indirectly through increased oxidation, as to the left. The child having inherited weak adrenals, its heart was never fully developed C. E. de M. S.].

Rolleston and Boyd (Brit. Jour. Child. Dis., xi, 105, 1914) observed a case of Addison's disease in a boy, aged 12 years. A general bronzing of the skin developed gradually. It was especially marked around the nipples, the umbilicus, and pudenda. There were a number of pigmented scars on the body but no buccal pigmentation. The boy developed synchronously loss of energy, drowsiness, a cough at night and nocturnal enuresis. The heart was small. An uncle and a brother are said to have had tuberculosis. There were no signs of pulmonary or spinal tuberculosis and von Pirquet's reaction was negative on two occasions. The skiagraph showed calcification in the adrenal glands and discrete and dense opacities at the hila of the lungs suggesting calcified nodules. The red-cell count was high, 6,492,000, and there was a high lymphocyte count supposed to be indicative of lymphatism and a bad prognosis. The eosinophiles were high, from 5 to 7 per cent. The heart was also small in this case.

Rutelli (Pediatria, May, 1916) observed a case of Addison's disease in a little girl. The bronzing was first noticed at about the age of 4. At 10 it was extremely pronounced. The blood-pressure was rather low and the child was growing progressively weaker.

Caussade and Blanchier (Paris Med., Aug. 3, 1912) observed a rapidly progressive case in which the pigmentation, both of the mouth and skin was jet black. The case was a recurrent one, two previous attacks having occurred and retroceded. The autopsy showed tuberculosis of the adrenals and lymph nodes, but no pulmonary lesion.

Sicard and Haguenau (Paris Méd., May 23, 1914) found that in cases showing rapid development there was an increase of urea—2 grams or thereabouts—although the kidneys showed no lesions, macroscopical or histological, at the autopsy.

Etiology.—Neumann (Deut. med. Woch., Dec. 16, 1915) reported the third case in a single family. The malady was not due to tuberculosis of the adrenals. The skin and mucosæ showed the characteristic melanosis, there was asthenia, with increased tolerance for grape sugar and absence of adrenalin glycosuria. Adrenalin was present in the blood serum, but in diminished percentage, as shown by the frog's eye test. The patient is still living, but one of the brothers who came to autopsy was found to have primary atrophy of the adrenals.

The Pirquet tuberculin skin test was strongly positive in a case observed by Rutelli (Pediatria, May, 1916). An older child in the family had died of tuberculosis and the little patient had a history of enlarged glands in the neck and spina ventosa. The urine findings were apparently normal except for slightly subnormal figures for urea and for creatinin.

Pathology.—The glucose content of the blood in Addison's disease was studied by H. Schirokauer (Berl. klin. Woch., xlviii, 1505, 1911). The plasma contained 0.072 per cent. and 0.086 per cent. glucose respectively. These are normal values, though near the lower limits of the normal, and do not agree with the findings of Porges, who reported a hypoglycemia as one of the characteristic features of Addison's disease. While admitting that a hypoglycemia may be met with, the writer contends that it is not an essential part of the pathological physiology of the disease.

As G. M. Piersol (Boston Med. and Surg. Jour., July 17, 1913) states, the most frequent pathological change noted in the adrenals is tuberculosis Other local lesions are simple and inflammatory atrophy, carcinoma, sarcoma, melanotic tumors, hypernephroma, gumma and echinococcus disease. Necrosis, a condition observed in one of his cases is not mentioned as a usual adrenal lesion. It involved chiefly the medulla.

Lippmann (Med. Klinik, Apr. 6, 1913) observed a case of acute Addison's disease in a previously healthy young sailor, terminating fatally the eighteenth day. The blood-pressure began to fall, then intense weakness, signs of intoxication, and pigmentation followed in quick succession. Adrenalin was given in large doses subcutaneously. This tided the patient along, evidently prolonging life temporarily. Both adrenals were found in total cheesy degeneration but the solar ganglion was intact; one accessory adrenal showed considerable hypertrophy.

In 2 typical cases of Addison's disease in Filipinos described by Crowell (Philippine Jour. of Sci., Nov., 1911), the adrenals were destroyed by tuberculosis but the semilunar ganglia contained chromaffin. Other ductless glands were also the seat of pathological process. In 1 there was hyperplasia of the islands of Langerhans associated with adrenal and thyroid tuberculosis; in the other, one parathyroid was cirrhotic. The difficulty of diagnosis in Addison's disease in dark skinned races is great on account of the absence of pathological melanoderma and the possible presence of widespread tuberculosis.

Lowry (Deut. Archiv f. klin. Med., cx, 373, 1913) observed a typical case of Addison's disease, in which the autopsy showed complete absence of the specific cellular elements of the cortex of both adrenals, which were composed entirely of medullary parenchyma; second, the presence of a well-developed status thymicolymphaticus. Hedinger had previously called attention to the fact that 15 cases of Addison's disease showed the existence of a status thymicolymphaticus, while in 5 others there was pronounced lymphatic hyperplasia. It has been shown experimentally in animals that the adrenal cortex is necessary for life, a finding apparently confirmed in this case. The persistently low blood-pressure, despite the apparent integrity of the adrenalin-producing cells, suggests that the thymus may have been responsible, Mohr having shown that thymus extracts are capable of producing tachycardia, asthenia, and low vascular tonus.

F. Schotten (Münch. med. Woch., Nov. 3, 1914) reported a case of male fern poisoning in latent Addison's disease. The remedy was given with castor oil for a tape worm. The autopsy showed tuberculosis of the adrenals—a true Addison's disease. Most of the cases of poisoning by male fern are those in which employment of the drug has been followed by the administration of castor oil. The use of the combination is strongly warned against.

[I have long urged that the adrenals took part in the autoprotective functions of the body, and that when they were diseased poisoning occurs more readily. Hence also the vulnerability of such cases to infection. C. E. de M. S.].

adrenal gland in, i. 371, 372, 373, 763

As stated by Sergent (Jour. de Méd et de Chir. Prat., June 10, 1913) true Addison's disease can often be benefited, and sometimes even recovered from, at least in its glandular manifestations (its most important ones) by **adrenal opotherapy,** which not only makes up for deficiency of secretion, but also leads to a compensatory hypertrophy which to some extent replaces lost glandular tissue.

F. L. Angior (Lancet, May 18, 1912) refers to cases in which **adrenal gland** in doses ranging from 6 to 20 grains (0.4 to 1.3 Gm.) three times a day, proved very efficient. He mentions another case in which sudden death occurred as the patient tried to sit up in bed. One group of cases included the mother, son, and daughter.

Hirtz and Debré (Paris Méd., June 27, 1914) treated a typical case of Addison's disease in 1902 and obtained a cure with **adrenal gland,** the only symptom left being a discrete melanodermia. Eleven years later the patient died of gastric cancer. The autopsy showed a small cicatrix in the left adrenal.

In a typical case of Addison's disease observed by Klein (Deut. med. Woch., Aug. 1-8, 1912), the patient's weight had come down from 186 to 95 pounds. None of the remedial measures used were of the least avail. He was then placed upon fresh **adrenal glands** from the sheep, taking them raw and minced. As he developed repugnance to these desiccated gland was substituted. The improvement was striking, all the symptoms showing change for the better. He had recovered 50 pounds of his weight, and his improvement otherwise was harmonious, when suddenly and without apparent cause acute gastritis set in, with prostration. It was found that he had suspended his adrenal treatment for over 3 weeks. His stomach was unable to retain anything. Cerebral symptoms now set in and death took place from coma. The lesson of this case is that we have not sufficiently tested organotherapy in these cases. Others have obtained equally favorable results, and the best evidence of the efficacy is the aggravation of these cases when the treatment is suspended.

[As I urged some years ago, the temperature should guide the employment of adrenal gland. Where hypothermia exists, 5 or 10 grains (0.3 to 0.6 Gm.) of the desiccated gland may be given after meals, and increased, if need be, until the normal temperature is reached, when just enough should be given to keep it at the normal level or slightly above.

In many cases, however, hypothermia does not occur, because the morbid process, tubercular, cancerous, etc., not only perpetuates a toxemia which excites the diseased adrenals through its secretory nerves, but also causes a local reaction which tends to destroy the adrenals themselves. When, therefore, the temperature is above normal in a case of Addison's disease, we should ascertain the nature of the causative disorder, and treat it besides administering adrenal gland. C. E. DE M. S.].

adrenal grafts in, i. 374

In a case reported by D. Murray Morton (Austral. Med. Jour., July 6, 1912) in a woman of 35 years, the typical features of Addison's disease were present. Under **adrenal gland, tuberculin** every 10 days, and **iron** and **arsenic,** the patient improved, the blood-pressure rising from 95 to 110. In 6 weeks the patient was very well, and went to the country. She soon relapsed, however, and the treatment was repeated with no good effect. During a period in which she was very weak and low, **transplantation of an adrenal** was performed. On March 17th a male patient died of heart disease. The cadaver was taken immediately to the anesthetising room adjoining the operating theater, and the right adrenal removed and placed in normal saline solution at 100° F. In the operating theater cocaine and adrenalin solution was infiltrated over the lower ends of the patient's recti abdominis. A longitudinal incision was made on each side, and the sheaths of both right and left recti laid open. The adrenal was bisected, and half of the gland was then buried in each rectus muscle. The sheaths of the recti were then closed with continuous catgut sutures, and the skin wounds with horse hair. The patient was very ill after the operation, but from 21st March improved rapidly. By 2d April she was up, and was at the time of writing in comparatively good health. The pigmentation was distinctly less, and she had gained one stone (14 pounds) in weight. The blood-pressure on the 19th June was 104.

adrenalin in, i. 374

In using **adrenalin** it should be remembered that the sudden constriction of the arterioles it produces, may give rise to untoward phenomena by cutting off the blood-supply from vital organs and agonal sweating.

In a case of advanced Addison's disease reported by Lowry (Med. Klinik, Nov. 1, 1914), an intravenous injection of adrenalin caused sweating over the entire body and then sudden arrest of both the heart and the respiration. Only after half an hour's vigorous artificial respiration was the patient revived. In another case an intravenous injection was followed by intense tremor and pallor, and the left side of the face alone was bedewed with sweat.

gastric lavage in, i. 372
hydrochloric acid in, i. 372
iodides in, i. 370
light therapy in, vi. 363
mercury in, i. 370

In a typical case Teschemacher (Deut. med. Woch., Mar. 6, 1913) obtained complete disappearance of the bronze discoloration of the skin and marked improvement of the general condition with **adrenal** used persistently.

Case of Addison's disease, which rapidly improved under **mercurial treatment,** is reported by Gaucher and Gougerot (Ann. des mal. ven., May, 1911), and was, therefore, deemed of syphilitic origin. The patient, a man, aged 32, had all the classical signs of the disease, which was only of a few months' duration. About 3 years previously he had chancre of the penis, but no secondaries were noticed; however, he presented patches of leucoplakia on the tongue and labial commissures. Rapid improvement took place under 20 injections of benzoate of mercury. The authors conclude that syphilis may be a more frequent cause of Addison's disease than is generally supposed, and, therefore, that it is important to search carefully for any signs or history of syphilis in these cases, since improvement may result from specific treatment. They refer to other cases of Addison's disease of syphilitic origin, reported by Gaucher, Barlow, Hadden, Boinet, and Schwytzer.

nutrient enemata in, i. 372
open air in, i. 371
pituitary gland in, i. 781
salt solution in, i. 372
spermin in, i. 785
strychnine arsenate in, vii. 148
suprarenal gland in. See Adrenal Gland above.

In a case observed by Munro (Brit. Med. Jour., Mar. 23, 1912) suspected of tuberculous origin, the patient's sister having died of tuberculosis, the patient was treated in the usual climatic and general hygienic way, and in addition received several courses of **tuberculin** injections. The patient is in good health and able to perform rather arduous duties.

[Most clinicians overlook the fact that the causative disorder should also be treated, and administer adrenal gland alone, often failing to cure. In truth adrenal gland should only be regarded as important adjunct to the treatment of the causative disorder, and calculated to compensate for the reduced secretion the diseased adrenals produce. C. E. DE M. S.]

in pregnancy, vii. 612

Although, according to E. Vogt (Münch. med. Woch., Aug. 19, 1913) pregnancy may continue undisturbed in Addison's disease, he observed a case which resulted in stillbirth at full term, and another of premature birth at the thirty-fifth week. Generally there is no cause for abortion. In the face of the bad prognosis for the mother, it is best to allow pregnancy to continue to full term, with the hope, at least, of saving the child. The prospects for the children are not bad, even when there is premature birth. They develop normally.

mental disorders in, vii. 664
Adenectomy, i. 184, 190, 401, 409
Adenitis, i. 374; viii, 540

Etiology, i. 377; viii. 542, 543, 545.—Cases of cervical adenitis are usually supposed to be tuberculous, yet, according to Coues (Boston Med. and Surg. Jour., Nov. 18, 1915), some may be gummatous, and careful study should be made to prove or disprove this supposition definitely. The clinician should obtain an exhaustive history of each case to arrive at a correct diagnosis.

Two cases of adenitis of the elbow due to fever were observed by L. Verdelet (Jour. de Méd. de Bordeaux, Apr. 21, 1912). In the one case staphylococci were found in the pus evacuated from the epitrochlear lymph-node in a convalescing young child. The germs may have entered by a small wound of the thumb. In the second case of the same kind the epitrochlear lymphadenitis subsided without suppuration under systematic application of wet compresses. It was probably a primary typhoid lesion.

In the majority of cases (80 per cent.) of chronic cervical adenitis, according to Gardiner (Lancet, Oct. 2, 1915), where no obvious source of infection is present, the tonsils are infected. The size of the tonsil makes no difference as to their infectivity, except that the small fibrotic variety is likely to be more dangerous than the large. The organisms are present in the deepest parts of the gland.

To the familiar relation between the teeth and the cervical glands, G. H. Wright (Boston Med. and Surg. Jour., Jan. 7, 1915) also adds a mechanical factor—the pumping into adjacent tissues of débris through loose teeth and mastication, an open door for the entrance to the glands of tubercle bacilli.

[As I have emphasized in the article on the Thymus and Lymphatics (vol. viii. page 533) the lymphatic nodes are not mere barriers for bacteria, but protective structures in which all kinds of pathologic organisms are assailed by phagocytic lymphocytes, in order to stay as long as possible, and perhaps prevent, their penetration toward the blood-stream. While a proportion of enlarged lymphatic glands are tuberculous, others may be due to the presence in them of other organisms, a fact which imposes the necessity in all cases of ascertaining the causative agent among the many now recognized. The foregoing abstracts illustrate this fact. C. E. de M. S.]

bronchial and peribronchial, viii. 548

Diagnosis, viii. 549.—W. W. Howell (Amer. Jour. Dis. of Children, Aug., 1915) examined over 300 children from infancy to 13 years of age from the Infants' Hospital, from a large school and from private practice, X-ray being employed to confirm d'Espine's sign. While the point on the vertebral column at which whispered voice changes from a vesicular to a bronchial character was given by d'Espine as taking place at the 7th cervical in a few cases, the writer found the change as high as the 7th cervical, but commonly at the 1st and 2d dorsal, and frequently as low as the 3d without cause. The average height was found to increase with age.

Howell, therefore, regards as a positive d'Espine a change in character of whispered voice or expiration at or below the 3d dorsal. He thinks it advisable to think of these glands as of those up and down the trachea, and of those at the root of the lungs. Inflammation of both of the sets will give positive d'Espine, dulness accompanying those at the root of the lungs, and not with glands down the trachea unless there is also consolidation at the apex of the lungs.

Etiology, viii. 549.—The tracheobronchial glands are more frequently the seat of tuberculosis than any other structure, according to Girardet (Deut. med. Woch., July 9, 1914), who observed an instance of double perforation of a tuberculous nodule into the aorta and bifurcation of the trachea. Aortic perforation affords the readiest explanation of acute miliary tuberculosis. Softened glands also rupture into the lower portion of the trachea.

arsenic in, i. 384; viii. 551
blisters in, i. 384
brisk friction in, i. 384
calcium lactophosphate in, i. 384
cinchona wine in, i. 384
codliver oil in, i. 384
counterirritation in, i. 384
country air in, i. 384
creosote carbonate in, viii. 551
extirpation in, i. 384, 385
heliotherapy, viii. 551
guaiacol, viii. 551
ignipuncture in, i. 384
iodides in, viii. 551
iodine in, i. 384
iodotannic syrup in, i. 384
iron-iodide syrup in, i. 384
milk in, i. 384
nutritious diet in, i. 384; viii. 551
outdoor life in, i. 384; viii. 551
potassium chlorate in, i. 387
potassium iodide in, i. 384
sea-air in, 551
sea bathing in, i. 384
sodium arsenite in, i. 384
surgical measures in, viii. 551
tuberculin in, viii. 551
X-rays in, viii. 551

cervical, acute, i. 374

aristol in, ii. 118
antiseptic fomentations in, i. 378
aspiration in, i. 378
balsam of Peru in, i. 379
camphorated naphthol in, i. 378
carbolic acid in, i. 378
climatic treatment in, i. 379
creosote in, i. 379
ether in, i. 379
evacuation in, i. 378, 379

Adenitis, cervical, acute (*continued*).
excision in, i. 379
flaxseed poultice in, vi. 365
fresh air in, i. 378
glycerin in, v. 31
incision in, i. 378
iodine glycerole in, vi. 7
iodoform in, i. 379
iodoform gauze in, i. 378
mercurial (gray) ointment in, i. 378
mercury in, i. 378
poultice in, i. 374
removal of contents in, i. 378
resin cerate in, i. 378
salol in, i. 378
seton in, i. 378
sweet almond oil in, i. 379
tonic treatment in, i. 379
cervical, chronic, i. 379

The treatment of adenitis due to infections other than tuberculosis is given under the above heading; that of the tuberculous type being described below, under "tuberculous."

alcohol in, i. 387
arsenic in, i. 379
belladonna in, i. 387
betanaphthol in, i. 387
blistering in, i. 379
camphor in, i. 387
camphor-naphthol in, i. 387
camphorated guaiacol in, i. 388
cocaine in, i. 387
codliver oil in, i. 379
compression in, i. 379
electricity in, i. 379
hydrogen dioxide in, i. 387
ichthyol in, i. 387
iodides in, i. 379
iodine in, i. 379, 387, 388
iodoform ointment in, i. 387
iron in, i. 379
mercury in, i. 387
nourishment in, i. 379
out-of-door life in, i. 379
removal of diseased tonsil in, i. 379

In all cases of cervical adenitis the tonsils should be **removed** as the first procedure, according to G. L. Richards (Boston Med. and Surg. Jour., Jan. 7, 1915). If the glands are not broken down, and an operation on them has to be performed, then the tonsil should be removed at the same time. Especially is this warranted since removal seems to be followed by no deleterious effects on the organism, while the tonsil may afford entrance for rheumatic infection.

[As shown below prudence is necessary in the removal of diseased tonsils, lest general infection result if tubercle bacilli are present. Pottenger has recently (1917) emphasized the importance of prudence in this connection. My own practice is to give the **iodides** internally and to treat the tonsils by means of the **curette**, the **phenolated iodo-tannin glycerite** (see vol. vii, page 73) and **galvano-cautery** if necessary to close the crypts, removing the tonsils only if necessary after these procedures have greatly reduced or eliminated the danger of systemic infection. C. E. de M. S.]

silver nitrate in, i. 379
strychnine in, i. 379

In streptococcic adenitis, **streptococcus pyogenes vaccine** is recommended by the Committee of the Amer. Med. Assoc. (Jour. Amer. Med. Assoc., Apr. 20 *et seq.*, 1913).

cervical, tuberculous, i. 380

Etiology, i. 380.—In a study of glands secured from 110 cases of cervical adenitis, and examined directly and by culture and inoculation, A. S. Griffith (Lancet, June 19, 1915) found that of these, 10 sets of glands that were not tuberculous macroscopically, failed to produce infection in guinea-pigs. Glands from 29 other cases, all macroscopically tuberculous, and 15 of which showed bacilli on direct examination, all failed to infect guinea-pigs, the bacilli being no longer active. Glands from 71 cases produced tuberculosis in guinea-pigs. Of these, 37 contained bacilli of the human type and the 34 remaining of bovine type.

Analysis of the relative frequency of the 2 forms of infection at different age periods showed that the proportion of bovine infections was greatest in children under 5 years of age (90 per cent.), but that the bovine type of organism was by no means rare in adults over 20 years of age (23.5 per cent.).

In a girl of 11 years, known to have normal lungs and good teeth, a large abscess of the cervical glands, when incised, left a fistula. During a second operation Trautmann (Münch. med. Woch., Apr. 22, 1913) removed a number of cheesy nodules from the neighboring jugular veins. Although apparently normal, the tonsil of the same side was removed. Microscopical examination revealed a typical epitheloid-celled tubercle with giant cells.

Pathology, i. 383.—Tonsils that appear normal may have microscopic tubercles, according to B. C. Willis (So. Med. Jour., Dec., 1915). They, as well as adenoids, should be suspected to be the atria in all cases of tuberculous cervical adenitis, except when there are other demonstrable lesions about the head and neck. Early **tonsillectomy** frequently induces absorption of the glandular involvement and prevents or reduces the frequency of further systemic infection.

In 29 children under 12 years of age examined by Mitchell (Edinburgh Med. Jour., Sept., 1914) *post mortem*, particular attention was given to the cervical, bronchial, and mesenteric, also occasionally to the tonsils. Cultures were isolated from 12 cases. Eight cases yielded cultures of human tubercle bacilli; in 4 cases they were of the bovine type. In the 4 bovine cases there was more extensive and advanced caseation of the mesenteric glands than of any other group of glands. Of 80 cases of tuberculous cervical glands in children below 12 years old examined, the bovine bacillus was present in 71 instances (88 per cent.), and the human bacillus in 9 (12 per cent.). The maximum incidence occurred during the second year of life. Most of the cases were brought to hospital on account of a lump in the neck, which had been present for a varying period. All the children had been fed on raw milk.

Bier's hyperemia in, i. 388
creosote in, i. 387
curette in, i. 385
drainage in, i. 385, 386

According to Chaput (Paris méd., Apr. 22, 1916), the treatment by **filiform drainage** is simple and easily carried out under local or no anesthesia, and results in a cure, without any noticeable scarring, in about 2 weeks. In *small, superficial, closed, cold abscesses* in which the overlying skin is not inflamed, he passes a large needle completely through the lesion, carries 2 strands of horsehair through it, knots them to form a loop, passes through 2 more strands perpendicular to the first 2 (crucial drainage), and applies a dry **zinc peroxide dressing.** In large, deep abscesses of the same kind he makes a narrow, stab incision, explores the abscess cavity and its pockets with a probe or fine grooved director, and passes horsehair from the central incision through the two poles and the various pockets of the abscess (radial drainage). Where the skin is inflamed it can be kept from ulcerating by inserting crucial horsehair strands through the abscess from the sound skin; if perforation of the skin does take place it soon closes under a dry zinc peroxide dressing.

ether in, i. 387
incision in, i. 385, 387
iodoform in, i. 385, 387; vi. 51
iron iodide in, vi. 86
Koch's tuberculin in, i. 388
light therapy in, vi. 362
mercury in, vi. 86
operative interference in, i. 385
pancreatin in, vii. 299
strontium iodide in, viii. 408
subcutaneous extirpation in, i. 386

Iselin (Correspondenzbl. f. schweizer Aerzte; Wiener klin. Woch., Nu. 45, 1912) thinks that exposure to sunlight constitutes the most eligible conservative treatment, being preferable because it acts upon the entire body while taking the patient away from his ordinary mode of life.

sweet almond oil in, i. 387

In a case of unilateral tuberculous infection of the tonsils observed by H. F. Day (Jour. Amer. Med. Assoc., June 8, 1912) the marked cervical adenitis, subsided after **tonsillectomy** without any change in mode of living of the patient or tuberculin. One year after the operation the throat was clear, and only 1 or 2 minute glands in the neck could be palpated.

Tuberculin has a decided curative effect in all cases of tuberculous adenitis, according to A. R. Allen (Penna. Med. Jour., Dec., 1912). There is a marked increase in the weight, and improvement in the general health. Where discharging sinuses are present they close promptly, and wounds remaining from broken down glands heal kindly and rapidly.

At the Westfield State Sanatorium, Mass., according to H. D. Chadwick (Boston Med. and Surg. Jour., Jan. 7, 1915), patients having no more than 1 degree of temperature, and have no other signs of active pulmonary disease, are given **tuberculin** treatment, the bacillin-emulsion being used. The initial dose is one-millionth of a milligram and the course of treatment extends over a period of about 6 months until the maximum of 10 milligrams is reached. The glands decrease perceptibly in size and the area of dulness over the hilus becomes less pronounced. **Surgical interference** is necessary to remove only such glands as have become caseous or fibroid.

Koeppe (Zeit. f. Kinderheilk., vii. Nu. 1-2, 1913) has noticed that in giving von Pirquet's test the enlarged axillary glands on the side of the test frequently decreased in size, while those on the other side were unmodified. He concluded that the **tuberculin,** entering the lymph-spaces, was carried to the lymph-nodes, where it exerted a direct curative effect. Four were treated in the same way since, with good results, and he recommends it as a therapeutic measure in all cases where the lymph-nodes are swollen and hard and the Pirquet reaction is strongly positive.

X-ray in, i. 388

B. Baisch (Berl. klin. Woch., Nu. 44, 1911) reports 28 cases of tuberculous adenitis treated with X-ray. The glands were either simply enlarged or suppurating, caseous, or ulcerated with fistulous tracts. Enlarged glands if treated early with the rays showed a rapid diminution in size even to the point of complete disappearance. In the more chronic cases considerable decrease was observed, a small hard remnant being left which consisted of a capsule of cicatricial connective tissue enclosing a central area of caseous matter. In the suppurating or ulcerative types a complete cure could not be obtained with the X-ray until after **incision** and **evacuation of the pus.**

Cases of tuberculous adenitis were formerly given X-ray treatment to avoid unsightly scars, but to-day it is used because operation is followed by frequent recurrence. The X-ray treatment is to be preferred, according to R. H. Boggs (N. Y. Med. Jour., May 27, 1916), when the glands are scattered or broken down. Where there is pulmonary involvement, it is, with good hygienic treatment, the only method to be advised. Attention is called to a series of 1344 cases collected by von Mutschenvacker where operation was found necessary in only 9 per cent.

Of 13 cases treated with **X-rays** by A. Krecke (Beitr. z. klin. Chir., xcv. 609, 1915), 12 were completely or almost completely cured. There was recurrence in only 1 case; 2 withdrew; 6 have been under treatment for so short a time that results are not decisive. The best results were obtained in the caseous and fistulous cases, the very ones that are least amenable to other forms of treatment.

Both operative and tuberculin treatment are not productive of especially good results, according to G. M. Dorrance (Penna. Med. Jour., Nov., 1912), who highly recommends **X-rays**, with **open air treatment, forced feeding**, and **removal of primary source of infection.**

zinc chloride injections in, i. 387

inguinal, **iodine tincture** in, vi. 37, 39

mesenteric, i. 381, v. 752; viii. 625. See also Tuberculosis, Mesenteric, this Index.

sublingual, **iron** in, vi. 87

sodium salicylate in, vi. 87

Adenocarcinoma of the sweat-glands, viii. 448

Adenoid vegetations, i. 389

Symptoms and Diagnosis, i. 389.—Gritting of the teeth at night was noted in 34.4 per cent. of a series of 500 cases of adenoids by Benjamins (Nederlandsch. Tijdschr. v. Geneesk., July 17, 1915) and is believed by him of diagnostic value. H. O. Butler (Lancet, June 26, 1015) ascribes "growing pains" to adenoids in fidgety children with constant slight fever, slight cervical glandular enlargements, and a muffled first heart sound; great improvement follows adenoidectomy in these cases. H. B. Hayes (Charlotte Med. Jour., Apr., 1912) reports a case of petit mal in a boy of 3½ years, cured by removal of hypertrophied tonsils and adenoids, and W. C. Posey (Pa. Med. Jour., July, 1912) a child with mild bilateral exophthalmos, relieved by adenoidectomy.

Etiology, i. 395.—Various theories of the origin of adenoids continue to be put forth. F. Van Der Bogert (N. Y. State Jour. of Med., June, 1914) cites errors of diet, such as excess of sugars and starches and eating between meals, as favoring adenoid growth or recurrence. S. G. Vicente (Rev. de Med. y Cir. Pract., July 14, 1915) looks upon adenoids as defensive structures in prolonged exposure to pathogenic agents. L. Fischer (Jour. Amer. Med .Assoc., Jan. 13, 1912) lays stress on syphilis as a cause of recurring adenoids. According to T. Guthrie (Lancet, Apr. 20, 1912) the chances of recurrence in the ordinary case diminish rapidly from the age of four to seven, after which they are practically nil, unless anterior nasal obstruction exists or measles or whooping-cough supervenes.

adenectomy or **adenoidectomy** in, i. 401, 409

W. Sohier Bryant (Med. Rec., Sept. 9, 1916) lays stress on the close relationship between the nasopharyngeal glandular structures (adenoids, etc.) and the pituitary body. Not only are the functions of the latter morbidly influenced, but the results of adenotomy or other local treatment of these pharyngeal tissues—rapid growth and improved nutrition, relief of aprosexia and morbid somnolence, etc.—indicate to what extent the pharyngeal tonsil and the pituitary system are related. The cases of retarded growth relieved by adenotomy suggest, moreover, that adenoids inhibit the nutritional or developmental function of the pituitary system which we have come to understand as necessary for normal development. In a former article (Amer. Jour. Med. Sci., July, 1914) the author pointed out that the "adenoid" region was the part of the nasopharynx most assailable by infection, and that the angle of this region was the most vulnerable spot in the whole body.

The La Force adenotome has in recent years acquired much popularity. Heath (Laryngoscope, Feb., 1914) has added to this instrument a double tenaculum forceps, within the box of the adenotome, which grasps the adenoid mass laterally, pulling it down and pressing it to the center of the nasopharynx, after which the knife is pushed through. The growth is thus very easily and completely removed. Smith (Ill. Med. Jour., Oct., 1912) avails himself of tactile sensation by removing adenoids with a curet fastened to the index finger. J. L. Aymard (Lancet, June 24, 1916) believing direct inspection necessary for exact removal, uses a special tongue depressor and palatine retractor, and operates with specially shaped scissors and clamps, removing all adenoid tissue without risk of damage to adjacent parts. J. C. Beck (Annals of Otol., Rhinol., and Laryngol., June, 1913), while operating, has the soft palate held up by a rubber catheter, the ends of which are passed back through the nostrils and out of the mouth. Local application of Hess's **thromboplastin** is recommended by J. J. Cronin (Jour. Amer. Med. Assoc., lxvi, 557), as a preventive of post-operative hemorrhage, on the basis of results in 2036 adenoid and tonsil operations. As regards other complications of adenectomy, W. E. Grove (Johns Hopk. Hosp. Bull., Apr., 1913) points out that practically all the acute infectious diseases of childhood have followed it, and warns against operating in the presence of local infection or during epidemics. Much thought has been given to the reasons for unexpectedly slow and limited improvement of the patient in some instances of adenectomy, especially as regards 'mouth breathing. Development of the respiratory muscles by systematic **nasal breathing exercises** after adenectomy is advised by T. B. Layton (Lancet, Apr. 18, 1914) and J. M. De Kraker (Jour. Amer. Med. Assoc., Sept. 25, 1915). I. Sobotky (Boston Med. and Surg. Jour., Feb. 13, 1913), however, regards such exercises as insufficient, and recommends operative treatment. If a high palatal arch has already been formed, the **orthodontia** should be resorted to, to spread the arch and regularize the teeth.

Submucous resection, where the septum is deviated, or **bipolar electrolysis** of the turbinates, when enlarged, are available after the period of puberty. According to W. Wilson (Lancet, Dec. 6, 1913), many failures in tonsil and adenoid operations result from neglect to remove enlarged posterior ends of the inferior turbinates. Persistent "throat cough" and laryngeal catarrh after operation is often due to a septic condition or hypertrophy of the lingual tonsil. O. W. White (Jour. Amer. Med. Assoc., Sept. 25, 1915) has even noticed that in some cases mouth breathing develops without any malocclusion or nasal obstruction, the mouth simply being involuntarily relaxed. This is corrected by forced nasal breathing at night through the use of lip and **chin bandages.** Skilful massage of the relaxed tissues is also helpful. F. Warner (Lancet, Dec. 20, 1913) finds the pharynx, as a rule, relatively small in children with adenoids, sometimes interfering with respiration, deglutition, and clear speech after the adenoids have been removed. He believes it possible in such cases to develop and broaden the bony pharyngeal walls by **exercises of the pterygoid muscles,** viz., lateral, vertical, and anteroposterior movements of the lower jaw, made against resistance offered by the hand of an instructor who holds the jaw firmly.

  A. C. E. mixture as anesthetic in, i. 404; iii. 265
  ether as anesthetic in, i. 403; iv. 657
  ethyl bromide as anesthetic in, i. 403
  ethyl chloride as anesthetic in, i. 403; iv. 697, 698
  eucaine and adrenalin as anesthetic in, i. 402
  nitrous oxide gas as anesthetic in, i. 403
  nitrous oxide gas and ether as anesthetic in, i. 403
  stovaine as anesthetic in, i. 402
adenotomy in, i. 411
adrenalin chloride in, i. 400
alypin as anesthetic in, i. 402
artificial respiration, in asphyxia following surgery of, i. 411
atropine in, i. 403
B-eucaine as anesthetic in, i. 402
calcium chloride in, i. 401
calcium lactate in, i. 401
chloretone in, i. 403
chloroform in, i. 404
chromic acid in, i. 405
cocaine in, i. 402, 405, 406
diet in, i. 400

Adenoid vegetations (*Continued*).
  electric cautery in, i. 405
  glycerin in, i. 408
  hamamelis in, i. 407
  hygiene in, i. 400
  insufflation anesthesia in, i. 404
  iodine in, i. 408
  iron in, i. 400
  mentholized albolene in, i. 400.

A writer (Monde méd., Jan. 15, 1913) recommends the following oil, to be dropped in the nostrils, four or five drops on each side at short intervals, where adenoids are complicated by acute nasopharyngitis:

℞ *Mentholis,*
Camphoræ,
Eucalyptolis..āā gr. ⅘ (0.05 Gm.).
Olei amygdalæ
expressi ..... ʒj (20 Gm.).
M.

  morphine in, i. 403
  oil of Hungarian pine in, i. 403
  opotherapy in, i. 400
  organotherapy in, i. 400
  potassium iodide in, i. 408

This drug was used with success by E. Roos (Finsk. Laek. Handl., Feb., 1912) in a boy of seven in doses of 4 grains (0.25 Gm.) twice daily, operation being objected to. After three months the vegetations had completely disappeared.

  removal in, i. 412
  resorcin in saline solution in, i. 407

Where adenoidectomy is contraindicated Falkner (Med. Rec., Apr. 1, 1916) applies once daily for ten or twelve treatments a 100 per cent. solution of pure resorcin (in infants a 50 per cent. solution) to the adenoids.

  saline laxatives in, i. 401
  salt solution in, i. 401, 411
  Schleich inhalation mixture in, i. 404
  silver nitrate in, i. 405
  surgical measures in, i. 405
  tracheotomy in, i. 411
  X-ray in, i. 400

W. Stewart (Brit. Med. Jour., May 31, 1913) states that the X-rays exert a stimulating effect on chronically inflamed adenoid tissue, causing it to assume a healthy condition and decrease in size.

  and hemophilia, i. 408
    hemorrhage of, adrenalin chloride in, i. 409
      calcium chloride in, i. 409
      calcium lactate in, i. 409
      ferruginous tonics in, i. 409
      gauze tampon in, i. 409
      tannogallic acid in, i. 409
      thrombokinase in, i. 408, 409
  asphyxia in surgery of, i. 411
      artificial respiration in, i. 411
      forcible opening of jaw in, i. 411
      hypodermic injections in, i. 411
      traction of tongue in, i. 411
      tracheotomy in, i. 411
Adenoidectomy or adenectomy, i. 401, 409
Adenomata, ii. 763
  adrenal, ii. 763
  of the liver, ii. 764
  of the penis, vii. 344
  of the stomach, viii. 394
  of the thyroid, ii. 764; viii. 561
  of the tongue, viii. 567
Adenotomy, i. 411
Ader's receptor, v. 319
Adhesions, perigastric, thiosinamine in, viii. 530
Adiposis, see Obesity, vii. 151
Adiposis dolorosa, i. 412; vii. 153

Symptoms, i. 413.—Several cases of this disorder (Dercum's disease) have been reported; of these, the following alone seem to present features worth recording.

Favre and Toumade (Lyon méd., May 11, 1913) observed a form localized in a lower extremity affected with sciatica. The subcutaneous thickening of the cellular tissue of the affected limb was demonstrated in picking up the integuments between the finger and thumb; it was not constant, but occurred especially in inveterate cases; the limb may be greatly enlarged by this local adiposis, which is painful on manipulation; nodular thickenings may be present. The writers regard this panniculitis as trophic, and due to neuritis; in its turn it compresses and irritates the sensory nerve fibers, and so keeps up the neuralgic pain. They also refer to a young girl showing a plaque of tender induration on one buttock that developed in the course of a few days; it was accompanied by radiating pains in the whole gluteal region; a year previously she had had a similar attack, which yielded to massage in a few days.

O. Klieneberger (Med. Klinik, Nov. 23, 1913) reported a case in a woman of 43 years, who had, besides a general adiposity, small nodules, ranging in size from a pea to a bean, in the deep portions of the fatty tissue, which nodules were distinguishable by marked tenderness on palpation. The motor power of the patient was greatly diminished. There was a marked increase of bodily fatigue, which was also demonstrable in peculiar paresthesias. In the psychic sphere there were typical signs of depression.

A series of symptoms pointed to an implication of the thyroid gland (Graves's type) and the hypophysis (alimentary glycosuria). The family history of the patient revealed severe nervous heredity of progressive degenerative nature.

[These cases, among others reported, emphasize the importance of the nervous system in the pathogenic process. That the pituitary body is an important feature of the morbid process was emphasized by Dercum when he attributed it to a disorder of what I had termed the "adrenal system" (the pituitary, adrenals, and thyroid acting conjointly as such). Geo. E. Price, in fact, found lesions in the pituitaries of 5 cases out of 6 examined *post mortem.* Dercum's article in the first volume of the present work indicates the dominating influence of these ductless glands. Yet, how are the nervous disorders awakened? Under Acromegaly a few pages back in this index, I refer to my own view that it is a function of the posterior or neural lobe of the pituitary body to co-ordinate, through sympathetic connections, the caliber of the arterioles of the body, including those which govern the secretory activity of the ductless glands.

In a paper read before the Southeastern Branch of the Philadelphia County Medical Society, May 1, 1914, I stated in this connection: "That we are dealing with a sympathetic vasomotor neurosis seems to me shown by many clinical facts. Besides the symptoms previously enumerated, frequent flushings with dermographia, there are also found over the fatty areas, enlarged veins and venules; the slightest blow causes ecchymoses with black and blue discoloration; the flesh is so sensitive that mere contact may cause severe pain, redness accompanying any exacerbation of the latter. Hemorrhages of various kinds, epistaxis, hemoptysis, menorrhagia, purpura, etc., are frequent and sometimes very severe. These appear to me to furnish the clue to the underlying cause of the fatty masses or lumps, etc., *hyperemia of these areas,* through inadequate contraction of their arterioles and secondary dilatation of the capillaries they supply, for when these hemorrhages are severe a remarkable fact occurs: the lumps, their tenderness and the pain in them —due to congestion of the cutaneous sensory terminals—all subside, sometimes for a considerable time. The outpouring of lymph first constitutes an edema which is soon followed by the fatty infiltration which constitutes the lumps.

"The pathological findings have shown that the thyroid is the seat of changes in most cases, but these bear the imprint of vasodilator hyperplasia and its varied consequence similar to those witnessed in goiter. This would indicate that the organ is the seat of secondary lesions—owing to the disturbed innervation—of its governing center, the pituitary, the seat of the primary lesion. Suggestive in this connection is the fact that in one of the cases reported, the genital organs were similar to those observed in Fröhlich's syndrome, due also to lesions of the pituitary or its efferent nerves—those which govern the functions of the thyroid and adrenals.

"That the painful fatty areas should be the seat of a chronic neuritis, as shown by Dercum and McCarthy and others, is a normal consequence of the local hyperemia, the vasa nervorum being themselves possibly dilated and engorged." C. E. DE M. S.].

Etiology, i. 421.—Arrest of ovarian functions, physiological or artificial, is occasionally associated, probably as a causal factor, with the appearance of Dercum's disease. Sabatucci and Zanelli (Policlinico, June 23, 1912) observed a case which developed after ovariectomy. The artificial menopause caused the development of vasomotor and mental symptoms, periods of excitement alternating with depression and suicidal tendency, and gradually nodular adiposis dolorosa developed, with painful nodules at various points on the forearms, thighs and lower part of the trunk. The patient improved greatly during the last few months under ovarian treatment and tonics. The headaches and vasomotor disturbances have subsided and no other nodules have developed. Pizarro (Semana Medico, xxiii, No. 13, 1916) report a case in a woman in whom at 46 the first sign of the adiposis dolorosa developed, and menstruation ceased at 48. At the age of 52 the disease, in the mixed form of adiposis, was extreme, as also the pains, but the urine was normal. Repeated Wassermann test elicited a positive response, and on the basis of the single Wassermann reaction vigorous mercurial treatment was applied, and improvement was promptly evident. The blood findings on repeated examination confirmed the clinical improvement. The masses of adipose tissue retrogressed almost entirely.

[The ovaries during their active period contribute to the body at large, from my viewpoint, a substance derived from the Graafian follicles, their corpora lutea and the interstitial stroma cells derived mainly from adrenal rests in those cells (see my work on the "Internal Secretions," 7th ed., p. 428, 1916). It is not a true secretion, but rather a chromaffin or adrenal substance in organic combination which is added to the stock available in the body at large as an economical measure, and which, therefore, contributes to the maintenance of the physiological caliber, if I may so express it, of the arterioles of the body at large, including the cerebral spinal and peripheral nervous systems. Unless, therefore, the adrenals or chromaffin system is able, as is often the case, to compensate for the loss of this ovarian product the familiar disorders of menopause appear. In some instances these assume serious proportions, owing to inherited or acquired diseases or debilitating conditions involving deficiency of the ductless glands, there are awakened morbid phenomena of greater moment. In Sabatucci and Zanelli's case artificial menopause caused a chromaffin paresis of the arterioles throughout the body, the mental phenomena being due in part to cerebral hyperemia, while in Pizarro's case the ductless gland deficiency, promoted by acquired syphilis, initiated the adiposis dolorosa. C. E. DE M. S.].

arsenic in, i. 431
aspirin in, i. 429
bathing between blankets in, i. 430
diet in, i. 430
exercise in, i. 429
iron in, i. 431
massage in, i. 430

In a case reported by C. M. Nice (Med. Rec., July 8, 1916) the administration of **pituitary gland** gave almost immediate and continuous improvement at least up to the date of the report.

[In the above case, the pituitary substance administered, which contains, as we have seen, chromaffin or adrenal substance in organic combination, produced effects similar but more durable than those obtained from adrenal gland itself. It counteracted precisely, therefore, the pathogenic element in the case, the deficient caliber of the peripheral arterioles. C. E. de M. S.]

rest in, i. 429

In a case of adiposis dolorosa observed by Claude and Sézary (Presse méd., Jan. 14, 1913) thyroid extract failed, and but trifling benefit resulted from adrenal and ovarian therapy; **fresh thyroid gland,** however, gave striking relief, 3 weeks' treatment causing great diminution of the adiposis. Relapse followed cessation of the fresh gland feeding so that fresh tender swollen plaques appeared; these yielded on resumption of the treatment. So long as the patient continued the use of thyroid she remained well in all respects but relapsed on its stoppage. After 4 months of this treatment her weight returned to normal or slightly below it.

Gloninger (Berl. klin. Woch., July 21, 1913) reports favorably on the action of thyroid extract in adiposis dolorosa in a woman, aged 51. **Thyroid** was well tolerated and given for several months, supplemented by various **hydropathic measures.** After 4 months there was marked objective and subjective improvement. There was less pain, the nervousness had ceased, the weight had diminished by 20 pounds without any change of diet, and the patient was able to resume her domestic duties. At first the pain prevented massage of the whole body, but with the loss of weight **massage** became bearable, and hastened the general improvement.

salicylates in, i. 429

salophen in, i. 430

strychnine in, i. 431

thyroid gland in i. 429, 751

Treatment, i. 429.—A patient of Kloninger's (Berl. klin. Woch., Jan. 21, 1913) was given **thyroid gland** systematically for 4 months. This caused marked subjective and objective improvement. Mild **hydrotherapy** aided to complete the cure, with **massage** after the tissues had become less sensitive. Sézary recently published a similar case in which a course of ovarian treatment failed to relieve but a change then to **thyroid** treatment was speedily followed by a complete cure. Fresh thyroid was given in this case.

[The remarks I submitted above, under Etiology, suggest that in all cases, of adiposis dolorosa we should ascertain if possible the identity of the disorder which directly or indirectly debilitated the ductless glands. While treating this causative disease, if any, organic products will serve to counteract their deficiency. In the present case, thyroid gland, through its hormone excited the chromaffin or adrenal system thus doing indirectly what pituitary gland would have done directly. A combination of **thyroid gland, pituitary,** and **lutein** is more effective than any single organic product. C. E. de M. S.]

vibratory massage in, i. 429

tuberosa simplex, vii. 153

Adipositas cerebralis, see Obesity, vii. 151

Adler's solution, viii. 200

Adnephrin, see Animal Extracts: Adrenals, i. 755

Adonis vernalis, i. 431

Roch (Arch. des Mal. de Coeur, June, 1913) noted an unmistakable cumulative action and a marked action on the heart. The patient had taken 6 Gm. (2½ drams) of the drug in an infusion daily for 56 consecutive days—a total of 396 Gm. (13⅕ ounces). He was a large man of 65, hearty, with mitral insufficiency and alcoholic cirrhosis. There were no signs that the drug was proving toxic, no headache, nausea nor pain in the stomach, but the pulse of 43 then developed a typical bigeminus form. On suspension of the drug the beat returned to the normal type in the course of 3 days. Mayor and Segond last year published research showing that the digestive juices have a destructive action on the active principle of adonis.

Slovtzoff (Roussky Vratch, Sept. 15, 1912) found that in frogs and dogs the watery extract caused a marked slowing of the heart, owing to stimulation of the pneumogastric and its terminal branches, the blood-vessels being contracted and the blood-pressure raised. The alcoholic extract, on the other hand, had a very slight effect on the frequency of cardiac contractions, but increased their strength and also dilated the blood-vessels, the blood-pressure remaining unaffected.

Adrenal and pituitary organotherapy, see Pituitary, this Index.

Adrenal organotherapy, i. 755

Immunity, i. 435.—Many data tend to demonstrate a connection between the adrenals and immunity in its relations to both infections and poisons of exogenous origin. In fact the beneficial effects credited to adrenal products in the succeeding pages are in a great measure due to this all-important property, which, fortunately, is beginning to be recognized. Thus, Halpern (Archiv. f. exper. Pathol. u. Pharm., Oct., 1913) found that intraperitoneal injections of extracts of guinea-pig adrenals, bring about in some rabbits the formation of substances which exhibit a vasodilator property in frogs. He deems it justifiable to consider these substances as antibodies with *adrenalin as an antigen*, while D. E. Jackson (Jour. Pharmacol. and Exper. Therap., Sept., 1912) conducted experiments which tended to show theoretically that one of the functions of the adrenal glands was to assist by means of their internal secretion in *counteracting pathological processes or products which might tend to produce* an *abnormal constriction* of the *bronchioles*. Hence the fact that Josué (Paris Méd., Dec. 4, 1915) on the basis of his great clinical experience recommends that 1/60 grain (0.001 Gm.) of adrenalin be administered by *hypodermoclysis* in ½ or 1 pint (250 or 500 c.c.) of saline solution in *general infections*. Being absorbed slowly, its action is sustained. This but emphasizes the value of this agent in the many diseases enumerated under the preceding headings, and which need not be reiterated here. Additional evidence, however, is submitted under Therapeutics, below.

A property of antigens when excessively active is that producing hemolysis. Kariya and Tanaka (Jour. Tokyo Med. Assoc., vol. xxvi, No. 20, 1913), found that adrenalin has a relatively strong, though transient, *hemolytic action* probably not dependent on temperature. With the appearance of hemolysis on mixing adrenalin with defibrinated blood the mixture becomes brownish red. This coloring is due to the fact that the *adrenalin acts as hemoglobin* when it is freed upon destruction of the blood-corpuscles, and forms methemoglobin.

Its action on poisons is suggested, in keeping with similar data recorded under the headings under various drugs in this work, by the observation of J. L. Jona (Brit. Med. Jour., Feb. 8, 1913), who has observed that adrenalin prevents absorption of poisons, in poisoning by non-corrosive substances such as *cyanide, strychnine,* and *aconite,* and thus permits of the stomach being emptied or a suitable antidote administered. It should be given at once, followed by the antidote or the stomach-pump. Another small dose may be given to prevent absorption of any remaining poison.

So eminent an authority as Gley (C.-r. de l'Académie des Sciences, June 29, 1914) in experiments including the use of violent cardiac poisons, anagyrine and nicotine, obtained, after the destruction of all central vasomotor connections, effects which could only be attributed to the adrenals. He therefore concludes that we must recognize two classes of cardiac stimulants: those which act through the nervous system and those which act through the adrenals. This he regards as a new fact in our knowledge of the rôle of the ductless glands in their relations to poisons.

[Nothing of the above is new. I pointed out in 1903-1907 (Internal Secretions) that it was through the adrenals that digitalis and other cardiants produced their tonic effects, and not as generally taught even now, by a direct action of the drug on the heart-muscle —an absurdity. I also urge that the toxic phenomena observed by Albanese, Langlois and others should be attributed to the participation of the adrenal secretion in a general immunizing function. It is not as "antigen" that it acts, however, as believed by Halpern. C. E. DE M. S.]

Administration, i. 756.—W. B. Chamberlain having called attention to the pronounced vascular effects of injection of epinephrine and cocaine into the nasal submucosa, thus suggesting that the nasal submucosa might be an unusually good absorbing surface, since neither epinephrine nor cocaine produces these marked effects on hypodermic, or even intramuscular injection, J. D. Pilcher (Jour. Amer. Med. Assoc., July 18, 1914), at the suggestion of Sollmann, confirmed these effects by a series of experimental investigations. The effects were often found to approach and sometimes to be parallel with those produced by rapid intravenous injection, owing, doubtless, to the very great vascularity of the region. The injected material, in fact, was found at times to pass directly into the venous circulation, as shown experimentally. The administration of adrenalin in this manner clinically could possibly be of serious moment, such as causing a sudden rise of blood-pressure in cardiovascular disease, arteriosclerosis, etc. In conditions of circulatory collapse necessitating rapid stimulation, the injection of adrenalin into the submucosa of the nasal septum, or turbinals might be of much value.

H. R. Harrower (N. Y. Med. Jour., Nov. 4, 1916) contends that the favorable experiences with total adrenal gland therapy (by mouth), affords additional proof that the position of those who have contended that the oral administration of adrenalin is useless, is fallacious.

Minute amounts of cocaine are capable of increasing the susceptibility of the vascular system to the action of adrenalin. R. Fischel (Zeit. f. d. Ges. Exper. Med., iv, 362, 1915) found that this influence is greatest when the two agents are contained in the same solution, but failed or was greatly reduced when the cocaine had been applied before the adrenalin.

Contraindications.—Fridericia (Ugeskrift f. Laeger, Dec. 9. 1915) enumerates the contraindications against *subcutaneous injections* of adrenalin. He found in literature 5 deaths following injections. In 1 of these a large dose (0.6 Gm.—10 grains) had been injected *into a vein* in a much debilitated patient with infarction of the lungs, granular nephritis and arteriosclerosis. In all the others the epinephrin had been injected into the muscle of the uterine cervix while the patients were under the influence of chloroform. He has also found 2 deaths on record after subcutaneous injection of adrenalin, but these were in *infants,* only 3½ months old. A number of clinicians have reported unfavorable experiences with subcutaneous injections of adrenalin in cases of *heart or valvular defects* and nephritis with high blood-pressure. On the other hand, testimony is constantly accumulating as to the value of adrenalin in sudden heart weakness in the course of acute infectious diseases. It is harmful where signs of a valvular defect or *hypertrophy of the left heart* exclude bronchial asthma. With cardiac asthma there is no expectoration or merely reddish foamy masses. Fine moist râles may be heard with cardiac asthma while with asthma of the bronchial type there are rhonchi.

Pharmaceutics.—For the sterilization of adrenalin solutions, L. W. Rowe (Collected Papers from Research Laboratory, Parke, Davis & Co., vol. 3, 1915) gives the following method: 1. Adrenalin chloride solution in ampoules can be heated continuously for 3 hours to the temperature of boiling water without any loss of activity. 2. The same can be sterilized by immersion in boiling water for 7 distinct periods of 15 minutes each without loss of activity. 3. Adrenalin chloride solution can be exposed to the air and sterilized at least twice under a variety of conditions without loss of activity. 4. It is more stable than the solution of a synthetic compound when both are subjected to the same sterilization treatment. The results obtained disprove the statement that the stability of the synthetic exceeds that of the natural product.

Great variation was found in the activity of commercial solutions of adrenalin by W. H. Shultz (Bull. No. 61, Hygienic Lab., U. S. Pub. Health and Marine Hosp. Service), and some, while highly active when the original package was opened, deteriorated very rapidly. Change in color of the solution indicates a loss of activity, but as the solution may be kept colorless by the addition of suitable chemicals, a colorless solution is not necessarily an active one. The presence of a precipitate in the solution indicates serious deterioration.

Tests.—E. Moreschi (Gaz. med. ital., Jan. 30 and Feb. 6, 1913), in actual tests for adrenalin found that of all those so far proposed, the reactions with iodine, corrosive sublimate, sodium bisulphate, and potassium bisulphate gave results distinctly superior to those of the other chemical tests. Each reaction, however, proved disadvantageous in some way, and the author sought to obtain better results by combining them. The procedure advised is as follows: Down along the side of a tube containing the epinephrin solution allow to run a small amount of iodine tincture. A pink ring will at once form where the fluids come into contact; this color will gradually spread throughout the subjacent fluid. In the case of very dilute solutions the color disappears very rapidly. There are then added a few cubic centimeters of a 1:1000 aqueous solution of sodium or potassium bisulphate. A distinct red coloration reappears, sometimes purplish and persistent. This reaction by reason of the rapidity of the response and the duration of the resulting color, appears to be superior to the other methods. Its sensitiveness attains 1:2,000,000. The color was still plainly present after several days had elapsed.

Gautier (C. r. de la Soc. de Biol., Paris, 1912) states that adrenalin yields a red color with chloride of gold. In solution in distilled water, in tap water, and in distilled water to which 0.7 per cent. of sodium chloride had been added, gold chloride in a 1:300 solution in distilled water will yield a clear reaction with 1 part in 500,000 of adrenalin.

Stewart, Rogoff and Gibson (Jour. Pharm. and Exper. Therap., May, 1916) found experimentally that the response of the denervated eye to stimulation of the peripheral end of the splanchnic nerves, is due solely to the passage of a substance in the bloodstream from the suprarenals to the eyeball. When the venous path is blocked the response fails, but appears on releasing the block.

Untoward Effects, i. 759.—M. Donaldson (Brit. Med. Jour., Feb. 28, 1914) believes that adrenalin, while often restoring a pulse previously too feeble to be detected, does so at the expense of injury to the heart. His observations were made on healthy normal adults and on several patients apparently needing the drug, which was given subcutaneously in doses of 3 to 5 minims of the usual 1:1000 solution. The observations were controlled by injections of similar amounts of normal saline solution. In 7 normal persons subjective symptoms noted after the adrenalin were so marked that not one patient was willing to undergo any more observations. The symptoms complained of were chiefly breathlessness and a sensation of cold. The former was often extremely distressing, the latter so intense in 1 patient as to lead to a severe rigor. In normal persons, as well as in patients, there was usually blanching of the skin. Blood-pressure rose from 15 to 45 mm. in normal persons; the pulse-rate from 15 to 52 beats per minute. The symptoms usually passed off within a comparatively short time.

Gautrelet and Briault (Soc. de Biol., July 12, 1913) observed 10 and 20 days after an injection in dogs, the characteristic phenomena of *anaphylaxis* on injecting another dose of 1/65 grain (0.001 Gm.) of adrenalin and a weak dose of thionin, normally inactive. The usual primary rise of pressure and the secondary depression were observed.

In a case of pneumonia in a man of 65 years, L. J. Friedman (Med. Summary, Aug., 1915) injected subcutaneously 5 minims (0.3 c.c.) of 1:1000 solution adrenalin. About a minute after the drug was given, the patient became restless, dyspneic, facies blanched, eyes fixed, and complained of a constriction sensation around the body on the level with the heart. His pulse became almost imperceptible and thready. The condition resembled an attack of angina pectoris. An injection of an **oil solution** of 3 grains (0.2 Gm.) of **camphor** was immediately given, which acted with remarkable readiness in combating the attack.

Desgrez and Dorléans (Acad. des Sci., Paris, Nov. 17, 1913) found that **guanin** in a measure diminishes the toxicity of adrenalin. It very markedly reduces, moreover, epinephrin glycosuria. As the pancreas is rich in proteins from which guanin is derived, and even contains some free guanin, there is ground for believing that the latter substance plays a part in the regulation by the pancreas of the amount of glucose in the blood.

Therapeutics, i. 763.—The therapeutic use of adrenal preparations is indicated under the headings, throughout the work, of the diseases in which they have been found of real value. In many of these indications are described below under the heading "Adrenals," which includes a careful analysis of the rôle of these organs in disease, besides the progressive contributions of recent years to our knowledge of their functions.

Adrenals, i. 434

Physiology, i. 434.—W. B. Cannon (Trans. N. Y. Acad. of Med., May 4, 1916), who had previously found that the adrenals secreted an excess of adrenin (their normal secretion) under the influence of *rage, fear, or great excitement,* now finds that this excess of adrenin also caused an increased liberation of *sugar* from the liver, a prompt abolition of fatigue, increased coagulating power of the blood, while promoting a flow of the latter to the heart, lungs, the central nervous system, and the skeletal muscles. These urgent phenomena, added to the familiar dilation of the bronchioles and increase of red corpuscles, were preparatory to rapid fleeing when due to fear, and to fighting power when due to rage. A hormone relation with the thyroid gland was also demonstrated.

All this, according to Cannon, showed that besides any routine function, the adrenals had an emergency function brought out in times of great excitement. Evidence now tends to show, that the thyroid gland likewise has an emergency function active in critical times, which would serve to increase the speed of metabolism when the rapidity of bodily processes might be of the utmost defensive importance. Like the adrenals the thyroid was found to receive its impulses through the sympathetic system.

[All this is only serving increasingly to confirm conclusions I had published many years earlier. In the first edition of my work on the "Internal Secretions," published in 1903-1907, I gave the name "adrenal system" to a functional aggregate of the pituitary body, the thyroid, and the adrenals, the first of these being regarded as the governing center of the two latter organs, through sympathetic nerves. The pituitary, *i.e.,* its posterior or neural lobe (p. 604), I defined as "the center upon which all *emotions, shock, etc.,* react, and as the organ which initiates the impressions thus produced." As to the nature of these impressions, I defined them as due to "traumatisms, surgical procedures, an abnormal mental state, such as attends *fear, grief,* or *other emotions,* etc." But I wish to emphasize that even the adrenals and thyroid are but two of the several structures influenced by violent emotions. The sudden change in the number and character of heart beats, the equally sudden pallor of fear, the involuntary evacuations often observed in recruits when first placed on the firing line, etc., are not due to the ductless glands. The latter are influenced as are all other organs, by what to me appear as morbid impulses, rather than salutary or autoprotective ones as Cannon seems to believe. The many cases of Graves's disease, clearly traceable to fright, intense emotions, etc., for instance, could hardly be attributed to an autodefensive reaction. C. E. de M. S.].

Respiratory System.—Adrenalin was found by D. E. Jackson (Jour. of Pharm. and Exper. Therap., Mar., 1913) to produce a prompt *dilatation of the bronchioles* where these are contracted, this effect being wholly independent of the rise of blood-pressure. Januschke and Pollak (Arch. f. exp. Path. u. Pharm., lxvi, 205, 1911) found that intravenous injections of adrenalin caused an *increase of the respiratory excursions* of the lungs. The increase, however, was less noticeable in normal animals than in those suffering from "muscarin asthma." Plumier-Clermont (Bull. de l'Acad. Roy. de Méd. de Belgique, 4th Ser., vol. xxvi, No. 8, 1912), after a series of comprehensive experiments, found that, contrary to the prevailing view, *adrenalin acts upon the pulmonary vessels* as they do on the vascular system at large; *i.e.,* they cause constriction, though to a degree much less marked.

Auer and Gates (Jour. Exper. Med., xxiii, 757, 1916) found experimentally that a simple intratracheal injection of a solution in a normally breathing rabbit penetrates within a few seconds to the alveoli, chiefly those of the left lower lobe; that absorption is rapid and well maintained; and that the procedure may be repeated effectively a number of times even with a substance like adrenalin, which decreases absorption. It was also shown that absorption of adrenalin from the lung could be obtained at a time when double the dose given intramuscularly exerted no blood-pressure effect whatever, and that absorption could still take place after the development of pulmonary edema, when there was an undoubted dilution of the injection solution with a serum-containing liquid, and when a diminution of the absorptive field had occurred. They conclude that the solution injected, after reaching the alveoli, is probably largely taken up by the capillaries of the pulmonary veins. This is indicated by the great rapidity with which an intratracheal injection of adrenalin may cause a rise of blood-pressure. In numerous instances, for example, the pressure began to rise less than 5 seconds after the completion of an injection, equaling, and even surpassing in rapidity of effect, intramuscular injection.

Bernstein and Falta (Lancet,, June 29, 1912) found that injections of adrenalin in normal individuals produced an increased *consumption of oxygen* and also of *carbonic acid excretion.* The respiratory quotient was likewise increased.

[The foregoing abstracts cannot but recall that in the work quoted above (1903-1907) I pointed out that the internal secretion of the adrenals was the agent which, after passing through the heart with the venous blood, took up the oxygen from the air in the pulmonary alveoli. The need of such a secretion to account for phenomena witnessed had been indicated by various physiologists since Paul Bert, in 1878, showed experimentally that the absorption of oxygen by the pulmonary blood persisted, even when the pressure of this gas was almost *nil.* C. E. de M. S.]

J. P. Langlois (Tribune Méd., Sept., 1913) found that adrenalin injected into a normal dog arrested the respiration and expiration during a period lasting in some instances as long as 1½ minutes. It could not be attributed to excessive vascular tension, since successive injections 8 to 10 minutes apart, while causing the usual rise of blood-pressure, failed to cause a repetition of respiratory arrest. On the other hand, instead of causing respiratory arrest, an injection of adrenalin may caus *excessive respiratory activity, polypnea,* if the animal is heated (under chloralose anesthesia or without it) until its temperature is raised to 41.5° C. (106.7° F.), the increase being from 240 to 320 respirations. The author also found that when the vagi are cut in a polypneic animal, the polypnea becomes excessive, *e.g.,* raised from 240 to 350.

The influence of adrenalin on *respiration* is further shown by the experiments of Nice, Rock, and Courtright (Amer. Jour. of Physiol., June 1, 1914), which showed that whether the doses injected were such as to cause (as do minute doses), a fall of the blood-pressure, or (as do large doses), a rise of blood-pressure, they evoked an increase in the depth of respiration. Excessive doses, as Oliver and Schäfer, Langlois and others have done, produce a marked shallowness of breathing.

[The latter effect from my viewpoint is due to spasm of the muscles of the chest, owing to the excessive experimental dose administered. Dixon has observed that while small doses quickened the respiration, large doses inhibited it. C. E. de M. S.]

Heart.—G. von Andrep (Jour. Physiol., No. 5, 1912), in an experimental study, found that when the splanchnic nerve is stimulated, the resulting rise of blood-pressure was accompanied by constriction of the peripheral blood-vessels, and acceleration and *increased tone* and augmentation of the heart. This failed to occur after extirpation of both adrenals. Every rise of blood-pressure brought about by the agency of the nervous system thus involved the co-operation of the mechanism of the adrenals. That the acceleration noted does not always occur is shown by other investigators. When adrenalin is perfused through the cerebral circulation, it may in a certain per cent. of cases, according to E. D. Brown (Jour. of Pharm. and Exper. Therap., Apr., 1916), cause a *slowing of the heart,* due in part to a direct stimulation of the vagus center. The probability also is that it stimulates the vasomotor center. The effect on the respiratory center is very variable. There is evidence of both stimulation and depression irrespective of the size of the dose. Meek and Eyster (Amer. Jour. of Physiol., July, 1915) also found that the intravenous injection of physiologic amounts of adrenin into intact unanesthetized dogs with good vagal tone invariably causes a *decrease in the heart-rate.* Its action is twofold; it accelerates the heart by direct stimulation and inhibits it reflexly through the vagus.

Experiments on animals by F. Meyer (Berl. klin. Woch., May 12, 1913) showed that adrenalin produces a remarkable *acceleration of the coronary circulation,* the result of increased blood-pressure, from the heightened action of the heart. Barbour and Prince (Jour. of Exper. Med., Apr., 1915) observed that a decrease in coronary flow was the constant response of freshly isolated monkey hearts to adrenalin, after perfusion with autogenous hirudinized blood diluted with Locke solution. The general conclusion is drawn that, while actively dilating the coronary vessels in the dog, cat, rabbit, ox, sheep and pig, *adrenalin constricts the coronary vessels in man* and the monkey. The coronary arteries of the last two species are presumably supplied with constrictor nerves of true sympathetic (thoracicolumbar) origin.

In experiments carried out to ascertain the effect of hypodermic injections of adrenalin on the blood-pressure, and using 10 minims (0.6 c.c.) of the 1 : 1000 solution, Watson (Pract., Jan., 1914) observed that the effect, in all the experiments, was to *decrease the diastolic pressure more than the systolic was raised;* the persistence of the diastolic fall was also generally greater than the persistence of the systolic elevation. Palpitation tremulousness, and faintness were generally experienced after the injection. Adrenalin having been proved to cause contraction of the peripheral vessels, the great depression of the diastolic pressure it produces cannot be due to diminished peripheral resistance.

In a series of experiments on the pulmonary circulation, including the action of adrenalin, Führer and Starling (Jour. of Physiol., Dec., 1913) found that *in asphyxia the failing heart dilates,* and the output of the left ventricle gradually diminishes, with a consequent fall in the aortic pressure. At the same time the pressure in the pulmonary artery, vena cava and left auricle rises. When the right heart also fails the pressure in the pulmonary artery falls to that in the pulmonary vein and vena cava. Adrenalin causes diminished volume of the heart and raises the pressure in the pulmonary artery with a simultaneous fall of pressure in the left auricle. These effects on the pulmonary circulation must be due to a *contraction of the lung vessels,* since even in the isolated lung perfused with an artificial circulation, adrenalin produces a rise of pressure in the pulmonary artery.

Considerable interest attaches to the action of adrenin on the great *veins* near the heart. It has long been known that in the mammal the great veins, which correspond in some ways at least to the sinus venosus in the frog, beat rhythmically with the heart proper. Gunn and Chavasse (Proceed. Royal Soc. of London, vol. 86, B, 192, 1912-1913) had previously been unsuccessful, however, in obtaining a spontaneously contracting ring preparation of the superior vena cava. They have now found that a quiescent ring preparation of the superior vena cava of sheep, near the heart, can be made to beat vigorously and rhythmically by the action of 1 : 20,000 adrenin. They also found that a 1 : 100,000 adrenin solution, by acting upon ring preparations of veins remote from the heart—jugular, mesenteric, superior and inferior vena cava —caused a diminution in their caliber, as has already been known to be the case with arteries. These veins, therefore, probably contain venoconstrictor fibers from the thoracicolumbar sympathetic system.

Blood-pressure.—Cannon and Lyman have shown that, in the cat at least, when the blood-pressure is at a normal height, injections of pure adrenin in minute doses and at the proper rate invariably produced a depression of blood-pressure. If the initial tension is low, however, only an augmented pressure can be secured. Hoskins and McClure also found that in the dog the effect of minute doses of adrenin was characteristically a fall of pressure. Yet, in animals adrenin in minute (physiologic) quantities is known to have a pressor effect, and that an important function of the adrenals is to maintain tonicity of the vasomotor system, or, indeed, of the sympathetic system as a whole. Hoskins and McPeek (Jour. Amer. Med. Assoc., June 7, 1913), therefore, investigated further in the dog the vascular reactions to adrenal stimulation, noting particularly the effects of varying strength of stimulus. An incision about 2 inches long was then made through the body wall in the region of each adrenal. Through these a finger or finger and thumb could be inserted, and the adrenals carefully massaged. It confirmed the earlier results on the effects of varying dosage of adrenin, ranging from marked depression with a small discharge, to considerable rise of pressure when the glands were vigorously manipulated. In no case, however, was there secured a rise of pressure at all comparable to that following the ordinary therapeutic dosage of adrenalin. Where a maximal discharge was obtained, it continued for about four minutes after the massage had ceased. In experiments starting with a mean blood-pressure of 120 mm., very dilute solutions of adrenin gave a pronounced fall of pressure. When in the same dog, however, the initial tension was 40 mm., only purely pressor effects could be obtained.

These results, as well as those of Cannon and Lyman, add support to the conclusion that adrenal secretion cannot be an immediate factor in normal blood-pressure. There can be little doubt that the injection or discharge of adrenin in gradually increasing amounts will result first in an augmentation of any physiologic effect that normally circulating adrenin might be producing. It follows that since the first effect of such injection is depression, the adrenals have normally either no immediate influence or else have a depressor effect on arterial tension. It is only when a distinctly abnormal quantity is used that a hypertension occurs.

Hartman (Amer. Jour. of Physiol., Oct., 1915) found that dilute adrenalin slowly injected caused a *fall in general blood-pressure* in 48 out of 53 animals tried. Three of the animals in which a fall did not occur, were in poor physical condition, and 1 was just recovering from the effects of alcohol. Dilute adrenalin caused dilatation of the peripheral arteries even after extremely low pressures had been produced by hemorrhage. The same dose of adrenalin caused *constriction of the splanchnic arteries.*

Veins.—The assertion that the adrenals slow the *pulse-rate* is disputed by Hoskins and Lovellette (Jour. Amer. Med. Assoc., July 25, 1914), who found that in dogs normal adrenin discharge could be closely simulated by injecting the drug slowly into a femoral vein. It caused not only increased blood-pressure, but, generally, also accelerated pulse. They regard the latter as one of the adaptive functions of the adrenal glands. A. A. Grube (Roussky Vratch, Dec. 14, 1913) found on experimental investigation that adrenalin increases the volume of blood passing through the *veins* by stimulating the heart-muscle.

Skeletal Muscles.—Adrenin in massive dosages was found by Gunning (Amer. Jour. of Physiol., June, 1917) to produce a diminished circulation in the skeletal muscles. There was a preliminary increase in the outflow due supposedly to the blood present in the vascular spaces being forced into the veins by the vasoconstriction. There is a maintained secondary dilatation due probably to a fatigue of the vascular musculature. The vasoconstrictor threshold was found to be lowered by an increase in the concentration of the adrenin and by repetition of the injections.

Small doses of adrenin, according to Hartman and McPhedran (Amer. Jour. of Physiol., May, 1917) cause constriction of the vessels of the intestine, kidney, and often spleen. The minimal dose necessary to produce this is not the same for every organ in the same animal. Increase of the dose of adrenin causes in all cases marked dilatation of the *intestine.* This dilatation is brought about by doses materially less than those which are necessary to cause a rise in general blood-pressure. This dilatation in the intestine is under control of the central nervous system. Hoskins and Gunning (Amer. Jour. of Physiol., June, 1917) found experimentally that there was no definite correlation between adrenin dosage and volume changes; yet, dilatation predominated, particularly with larger doses. Often the dilatation was preceded by contraction. In some instances contraction alone occurred. Infusions frequently gave only enterodilatation in animals in which injections gave a preliminary contraction.

Urinary System.—In a study of the influence of adrenals on the kidneys, Marshall and Davis (Jour. of Pharm. and Exper. Therap., Sept., 1916) observed a marked lowering of renal efficiency in adrenalectomized cats. This may occur with a normal blood-pressure, and when the animals are in excellent physical condition. Hoskins and Gunning (Amer. Jour. of Physiol., May, 1917) failed to support without definitely disproving the view that in normal animals adrenin diuresis was due to renal dilatation. In both depressor and pressor doses it caused contraction of the *kidneys* of dogs and a corresponding decrease in the venous outflow. Sudden and slow infusions giving similar results.

The effect of adrenalin on the *ureter* was studied by Macht (Jour. Pharm. and Exper. Therap., Mar., 1916) by the use of longitudinal strips and rings of the ureters of pigs and oxen. Adrenalin increased the rate of ureteral contractions and the tonus of the ureter, larger doses inducing a condition of tonic spasm or tetanus.

Sweat.—The increase in sweat under adrenalin injected intravenously or subcutaneously into horses, sheep, calves and cats was studied by Muto (Mitteil. a. d. med. Fakultat. d. k. Univ. Tokyo, xv, Nu. 2, 1916). Pools of sweat were found under one of the horses. The findings indicate that both the sympathetic and the parasympathetic systems are involved in the production of sweat.

Spleen.—Whether injected instantaneously or infused in the *spleen* adrenin caused, according to Hoskins and Gunning (Amer. Jour. of Physiol., May, 1917), dilatation followed by a contraction. Occasionally the contraction was followed by a secondary dilatation after the administration of the adrenin was discontinued. Aside from the brief preliminary effect, however, in no case was a pure (primary) dilatation observed.

Blood. — Castren (Finska Läkare. Handlingar, Nov., 1916), in a study of the influence of adrenin on the leucocyte count, found that the changes were practically identical with those in his own leucocyte blood-picture after muscular exercise; they seem to be traceable to a similar mechanism.

Grabfield (Amer. Jour. of Physiol., Dec., 1916) found that the intravenous administration of minimal doses of adrenin (0.143 c.c. of a 1 : 100,000 solution per kilo) decreased *coagulation time* by increasing the amount of prothrombin in the circulating blood.

Adrenal Principle.—This could not be found by Lewis (Jour. Biol. Chem., Mar., 1916) in human *fetal suprarenals* by the use of the blood-pressure method and chemical tests. A suggestion of the presence of adrenin was found in the adrenals of 2 full term fetuses by the use of strips of uterus and intestines contracting in warm oxygenated Ringer's solution. The extract of the suprarenals of a 6 months' fetus tested with a contracting intestinal strip was entirely negative.

Stewart and Rogoff (Jour. Pharm. and Exper. Therap. Sept., 1916) studied the *spontaneous liberation* of adrenin in the cat on the basis of action on the blood-pressure in the same animal and concluded that the amount of adrenin spontaneously liberated in cats varied in different experiments from 0.0003 to 0.001 Gm. a minute for each kgm. of animal. After section of both sympathetic trunks in the thorax near the diaphragm, including the major splanchnics, this spontaneous liberation of adrenin was completely abolished.

In a study of the retroperitoneal tissues in man and other animals, Fulk Macleod (Amer. Jour. of Physiol., xl, 21, 1916) confirmed the view that *chromaffin tissues* are specific in their nature, and everywhere of the same essential character, as shown by the earlier experiments of Biedl and Weisel. J. F. Gaskell (Phil. Tr. Roy. Soc., London, ccv, B, 153, 1914) suggest that the chromaffin nerve cells of the invertebrate are the common ancestors of the chromaffin system and the sympathetic nervous system of the vertebrate. The contractile vascular system is thus regulated both by the sympathetic nerves and by the secretion of adrenin.

In the opinion of the Ogatas (Jour. Exper. Med., June, 1917), the chrome or *chromaffin reaction* as well as the silver and osmiun reactions are merely reductions by adrenin. In their opinion the naming of the cells giving a positive reaction should not be based on the reaction (that is, chromaffin cells), but on the presence of adrenin itself.

Voegtlin and Macht (Jour. Amer. Med. Assoc., Dec. 13, 1913) found that when an anastomosis was established between the vena cava and the portal vein, a train of symptoms occurred similar to those produced by digitalis. Suspecting that some substance normally present in the blood was destroyed by the liver, they isolated such a substance. It showed a relation to cholesterin and to the product of the *adrenal cortex.*

In a study of the influence of adrenals upon *carbohydrate metabolism,* Mackenzie (Archives of Internal Med., Apr., 1917) found that nervous stimuli, especially of the sympathetic, represented by piqûre or splanchnic stimulation, are followed by an increased secretion of adrenin, and this hyperadrenin causes hyperglycemia and glycosuria in part by inhibiting glycogenesis, and in part by furthering glycogenolysis. Adrenalectomized dogs showed a diminution of the power to form glycogen from glycose. Following adrenalectomy in depancreatized dogs there is a rapid disappearance of hyperglycemia. Sugar administered to such animals was neither oxidized nor stored as glycogen, but appeared quantitatively in the urine.

Thyroid.—Cannon and Cathell (Amer. Jour. of Physiol., xli, p. 74, 1916) noted that a small dose of adrenalin increased markedly the activity of the *thyroid.* This was also observed when the splanchnic nerves to the adrenals were stimulated. The thyroid seemed as actively stimulated by the adrenal secretion as it was when its sympathetic nerve was excited electrically.

Growth.—F. de Mira (C.-r. de la Soc. de Biol., Oct. 25, 1912) by removing the left adrenal in the cat and dog, 1 month old, and using animals from the same litters as controls, found that the operated animals grew smaller and relatively thinner than the latter, the bone-growth being inhibited especially as regards their thickness.

[This influence on *growth* is but a logical result of the deficient oxidation which removal of one adrenal entailed. Even though the remaining organ tends to undergo compensative hypertrophy it fails to replace completely the absent organ. C. E. de M. S.]

diseases of, i. 434

hyperadrenia, acute, or acute hyperadrenalism, i. 444

In "Internal Secretions" (1903-1907) I called attention to the fact that many drugs influenced the functions of the adrenals, some depressing them, others overexciting them. When from any cause, these organs are debilitated the loss of their influence in the defensive functions of the body (see vol. i, p. 435) causes it to be more easily affected both by drugs, toxins, and other poisons.

Sergent (Bulletin de la Soc. des Hôp., Feb. 26, 1914) states that hypoadrenic subjects tolerate **salvarsan** badly, and urges that when this potent agent is to be used the signs of hypoadrenia should be looked for. If these are present the patient should be confined to bed for a couple of days after the injection of salvarsan, and adrenalin be administered systematically during that time.

W. H. Brown and Louise Pearce (Jour. of Exper. Med., Nov. 1, 1915) found that toxic doses of all **arsenicals** of which we have any knowledge produce definite pathological changes in the adrenals of guinea-pigs. These changes include congestion, hemorrhage, disturbances in the lipoid content, cellular degeneration and necroses, and reduction in the chromaffin content. The character and severity of the injury produced by different arsenicals vary with the chemical constitution of the compounds. From these facts they conclude that adrenal injury is an important factor in arsenical intoxication.

Camus and Porak (Soc. de Biol., June 21, 1913) have shown that animals with adrenal insufficiency are more sensitive to intoxication of **curare** and **strychnine** than normal animals, and refer to the fact that a large number of poisons are more active in decapsulated animals than in normal ones.

[When the adrenals are the seat of disease, a drug, or an acute febrile process capable of raising abnormally the blood-pressure, may, by causing hemorrhage into these organs, cause sudden death, *i.e.*, what has been termed by Boinet "adrenal apoplexy." This is illustrated by the cases recorded below. C. E. de M. S.]

Proskauer (Therap. der Gegenwart, Dec., 1913) had a sudden death in a man of 47 after 20 c.c. (5 drams) of a 2 per cent. solution of **alypin** had been injected into the bladder. The only lesion found was an extensive *tuberculous process* in the right adrenal. He cites three cases from literature in which death followed at once after local anesthesia with cocaine or novocaine and in both cases the necropsy revealed a tumor in the adrenal medulla.

Méry and Heuyer (Paris Méd., May 30, 1914) reported the case of an apparently well boy complaining only of slight fatigue, who suddenly became comatose, the pulse reaching 140 and the temperature 104° F. (40° C.) and died in 36 hours. The autopsy showed *initial typhoid lesions* in the intestines and a caseous *tuberculosis of both adrenals.*

The influence of overactivity of the adrenals is illustrated by the action of tumors on muscular development, sex characters, etc., described below under "Hypernephroma."

treatment of hyperadrenia, i. 452
  amyl nitrite in, i. 453
  chloral hydrate in, i. 453
  ether (nitrous) spirit in, i. 453
  nitroglycerin in, i. 453
  pituitary in, i. 453
  saline solution in, i. 452
  veratrum viride in, i. 453

Although the adrenals have been regarded as impervious to **X-rays**, Zimmern and Cottenot (Arch. d'élect. méd., June 7, 1912) have found that hyperplasia with accompanying overactivity of the glands is reduced by them, owing to a retarding influence upon tissue proliferation. They obtained a reduction of blood-pressure, as shown by Pachon's sphygmo-oscillometer, following irradiation of the adrenals. Out of 16 cases, the pressure remained high in only 1. The technique consists of the use of hard rays No. 9 or 10 of the radiochronometer, filtered through 1 m.m. of aluminum. The rays are directed against the twelfth rib, at its junction with the vertebral column, the surrounding parts protected with lead, and with observance of a distance of 20 cm. from the skin.

Adrenals, Diseases of (*continued*).
  hypernephroma, i. 471; ii. 763; vi. 216

Hypernephroma, whether in the adrenal or in the kidney, contains considerable adrenal tissue, usually of the cortical type. It may provoke sexual phenomena. Van den Bergh (Nederl. Tydschr. v. Genesk., Nov. 13, 1916) describes a case in a girl of 3 years, in which a large, hard, retroperitoneal tumor could be felt in the left abdomen. Fever and increasing asthenia were also present. The child was some 5 inches above the normal, and her physical characteristics, especially the genital organs, were those of an adult. Death followed operation. A large adrenal tumor was found *post mortem.* Out of 15 cases found in literature by the author, the tumor was on the left side in 12. J. F. Baldwin (Jour. Amer. Med. Assoc., Dec. 26, 1914) describes the case of a boy in whom the sexual development began at about 18 months. At 10 months he could talk well; at 3 years his voice was that of a man; he had hair on the face and pubis, and was very strong and active. At 5 years and 10 months his facial appearance was that of a man of 35 or 40. Death followed soon thereafter. The autopsy revealed the presence of a large adrenal tumor.

Glynn and Heidetson (Jour. of Path. and Bact., July, 1913) state that after a study of 17 collected cases, abnormal sex characters do not always attend adrenal hypernephroma. In children they are almost invariably present in the form of hirsutes and often other abnormalities. In adult females before the menopause they are frequently present. In females after the menopause none is recorded, excepting a growth of hair on the face or change in the voice. In adult males they are probably absent. Adrenal cortical rests or bilateral hyperplasia of the adrenal cortex was noted in 15 per cent. of female pseudohermaphrodites, but in only 0.7 per cent. of male pseudohermaphrodites. According to the authors, there is no evidence that hypernephroma in the kidney, which shows a totally different histological structure from that in the adrenal, is ever associated with abnormal sex characters.

[The latter conclusion is erroneous as is well shown by the case of Jump, Beates and Babcock referred to below, and others on record. In some cases the histological structure is that of the adrenal cortex; such show more or less marked sex changes. Other growths of the kidney, particularly those derived from the tubules of renal adenomata, which have no histogenetic connection with the adrenal cortex, do not cause such changes. As urged recently by Fraser (Surg. Gyn. and Obst., June, 1916) the term "hypernephroma" should only include growths which are undoubtedly composed of adrenal tissue. C. E. de M. S.]

A case of hypernephroma showing small tumor in the anterior lobe of the pituitary and another in the left adrenal medulla with hyperplasia of the cortex, was described by J. Anderson (Glasgow Med. Jour., vol. lxxxiii, p. 178, 1915). While the adrenal lesion was suggested by marked hair growth, petechial hemorrhages on the hands and arms which became more generalized and grave, those of the pituitary (asthenia) marked adiposis, extreme headaches, slight exophthalmos, pain behind the eyeballs, insomnia, with ultimate death from asthenia. The author lays stress on the need, owing to the interdependence of the various ductless glands, of taking into account a polyglandular syndrome.

[This is true up to a certain extent. But as a rule, the pituitary and thyroid only show evidence of overactivity, hyperemia, and sometimes hyperplasia. In true adrenal hypernephroma we have the effects of disturbed equipoise of the various ductless glands with the affected adrenal violently imposing its functional activity upon all structures including the other ductless glands. Inasmuch as all actively influence metabolism, we are dealing with excessive metabolism with, from my viewpoint, oxidation (see vol. i, p. 434) as prominent function of the adrenals, run wild, and excessive development as a result. Indeed Israel, Neu and others have attached considerable diagnostic value to the development of fever during the early stage of hypernephroma, before the cachectic period has begun. C. E. de M. S.]

exploratory incision in, i. 480
nephrectomy in, i. 480
removal in, i. 480
of the adrenals, malignant, i. 472
of the kidney, i. 475

H. D. Jump, H. Beates, and W. Wayne Babcock (Pediatrics, July, 1913) also reported a remarkable case of this kind in a girl, who had begun to show growth of hair on the pubis at one year, and developed bodily very early. At the age of seven there was a profuse growth of hair on the pubis, in the axillæ, on the chin and upper lip. The skin of the abdomen and legs was rough. She was mentally precocious and remarkably strong. Her voice was coarse and deep. The clitoris was an inch long, half an inch in diameter, and notched on the under surface, suggested hypospadias. An abdominal tumor was discerned in the right hypochondriac region, without enlargement of the superficial lymph glands. At operation an enormous perivascular and adherent hypernephroma of the right kidney was removed, with death three hours after operation. The tumor occupied nearly the entire abdominal cavity. The uterus and ovaries were infantile. The left kidney and adrenal appeared normal. The lungs showed a moderate degree of metastasis. Microscopic examination of the tumor showed hypernephroma, with much tissue of the type of the adrenal cortex. No right adrenal body was found.

Reviewing other cases previously reported, one of the authors notes that of these 18 cases, 14 were girls.

One can differentiate these cases from true sexual precocity in girls by the presence in the latter condition of menstruation, enlargement of breasts and retention of female characters; and from similar conditions in boys by the development of the penis and testes. All of the 18 cases died before the sixteenth year. Exploratory operation should be done early, even before a tumor is palpable; with a tumor present, removal is imperative.

[When adrenal tumors are sufficiently large to be recognized by physical examination they have usually begun to break down, the case passing from the sthenic stage, when the signs are those of *hyperadrenia* to the asthenic stage, when the phenomena of *hypoadrenia* appear: asthenia, low blood-pressure, yellow or bronze pigmentation, dyspnea, cyanosis, etc., along with whatever symptoms the causative tumor may itself awaken. C. E. de M. S.]

hypoadrenia, i. 436, 456, 466

Diagnosis, i. 436.—The *white line* of Sergent, obtained by gently stroking the skin with the finger pulp, avoiding friction or rubbing, has been deemed of no diagnostic value by various writers. Lucien and Parisot (Glandes Surrénales, etc., Paris, 1913) however, give this sign its proper status [judging from my own experience, C. E. de M. S.] when they state that alone it does not demonstrate adrenal insufficiency, *i.e.*, hypoadrenia, but that it is of value when other signs of this condition—asthenia, low blood-pressure, hypothermia, etc.,—are also present. As Sergent himself says (Bulletin et Mém. de la Soc. méd. des Hôp., Nov. 27, 1913), it is not pathognomonic but confirmatory. Others, notably Bars (Paris, Méd., Jan. 1, 1916) confirm this fact. It is often clearly defined in certain infections.

Emile Sergent (Endocrinology, Jan., 1917) states that the white line attains its maximum clearness in the course of about 1 minute, and persists for 1, 2, or even 3 minutes before being gradually obliterated. This, at least, is what is to be expected in well-defined cases of adrenal insufficiency; the only ones, in fact, in which the test has any real value. Light plays an important part. In bright daylight or sunlight, or even in bright electric light, it is sometimes difficult to see the white line. After having made the tracing, he draws up the sheet or clothing in such a way as to cast a light shadow such as may be produced by a screen. By taking this precaution the phenomenon is readily observed.

Ravaut and Krolunitzky (Paris Médical, Sept. 25, 1915) state that Sergent's white line must be differentiated from 1, the line observed in meningitis, which is red with a white marginal line on each side, 2, the plain red line obtained on deep pressure due to vasomotor reflex action. The white line is most marked when hypoadrenia occurs in the course of infections, *scarlet fever, mumps, diphtheria,* etc. (see Terminal Form, beyond).

Treatment, i. 461.—A remarkable action of adrenalin in *general asthenia* was observed by Ralph Horton (Brit. Med. Jour., Oct. 17, 1914) in a lady of 72 years confined to bed by sheer weakness and listlessness. There was no disease, but the urinary secretion was only 10 to 12 ounces daily. Strong tonics, strychnine, etc., failed to resume their good offices, and nothing prevented the gradual decrease in strength or increased the amount of urine. Adrenalin, however, caused a dramatic result. In 48 hours the urine rose from 5 to 40 ounces; in a few days the patient was up, and in a week was out in a rolling chair. The improvement continued, but the patient continues to take adrenalin, as cessation at once causes renewed debility.

Tom A. Williams (Arch. of Diagnosis, Oct., 1915) draws attention to the parallelism existing between *neurasthenia* and the present conception of hypoadrenia, the symptoms of the former being: failing strength, prostration after exertion, cold extremities, anemia, constipation, loss of control of attention, weakness of memory and of will power, inability to perform mental work, incapacity of decision, abnormal throbbing from pulsating aorta. The presence of hypotension, hypothermia, and pigmentary changes in addition should suggest hypoadrenia as underlying cause.

[Williams's suggestion is a valuable one and should be heeded. To overlook the ductless glands in the pathogenesis of neurasthenia is to neglect an important and sometimes all-important factor of the disease, as personal experience has shown. C. E. DE M. S.]

In a case of Erb's *myasthenia* Sézary (Paris Méd., May 25, 1912) detected the classic signs of hypoadrenia and caused the disappearance of both sets of symptoms by the use of **adrenal gland.**

hypoadrenia, functional, i. 456

Pathology, i. 436.—The experiments of Friedman (Jour. of Med. Res., May, 1915) have shown that the secretions of the adrenal and thyroid glands are closely related with the gastric and duodenal mucosa. Removal of the adrenals and excessive thyroid activity produce experimental *ulcers of the stomach* and *duodenum.* These lesions are prevented when the thyroid secretion is diminished. In other words, the formation of such pathological processes seems to depend upon deficient adrenal and excessive thyroid activity. While the lesions are not in many instances true ulcers, they are at least seats for the formation of true peptic ulcers, since hyperchlorhydria is generally associated.

That the adrenals alone may produce gastric lesions was shown by the experiments of F. C. Mann (Jour. Exper. Med., xxiii, 203, 1916), who found in a large percentage of dogs and cats dying after adrenalectomy, *peptic ulcers* at the site of local hemorrhages in the gastric mucosa. They usually penetrate to the muscularis mucosa with a total loss of epithelium, and develop in the absence of pancreatic secretion and bile. They appear, however, to develop only in an acid medium. Thus, in 10 experiments in which sodium bicarbonate was given after removing the second adrenal, ulcers were found in 1 animal only.

in the adult, **adrenal substance** in, i. 465
meat in, i. 464
mercury in, i. 464
in the child, **adrenal gland** in, i. 463

D'Œlsnitz (Presse médicale, Sept. 13, 1913) enumerates the morbid effects of moderate hypoadrenia in childhood. These include *retarded* growth and walking, flabby muscles. emaciation, apathy, fatigue, physical and mental indolence, and low blood-pressure. **Adrenal gland** proves very efficient in such cases.

arsenic in, i. 463
Blaud's pill in, i. 463
calomel in, i. 463
digitalis in, i. 463
meat in, i. 463
mercury biniodide in, i. 463
milk in, i. 463
strychnine in, i. 463
thyroid gland in, i. 463
in the infant, **maternal milk** in, i. 461

H. E. Tuley (Louisville Monthly Jour. Med. and Surg., June, 1916) reports the case of an infant born partially asphyxiated and which did not respond readily to attempts to stimulate respiration. Violent convulsions, followed almost immediately by a rectal temperature of 104.4° F. (40.2° C.), accompanied by marked discoloration of the skin. The clinical diagnosis was cerebral hemorrhage, but at the autopsy, it was found to be a case of hemorrhage into the left adrenal.

in old age, **adrenal gland** in, i. 466
beef juice in, i. 465
buttermilk in, i. 465
diet in, i. 465
milk in, i. 465
progressive, i. 466

This form may be regarded as synonymous with or leading to Addison's disease. In a case reported by Woolley (Jour. Labor. and Clin. Med., Apr., 1916) the adrenal medulla was hyperplastic and at one point was the area which at *post mortem* has been taken for possibly an adenoma. This turned out to be a mass of myeloid tissue almost completely surrounded by well-formed bone and containing within it at more than one point several *miliary tubercles.* Further search in other sections brought to light occasional tubercles in the cortex of the adrenal, usually closely associated with the myeloid areas. Careful study of these anomalous foci gave definite evidence that they were actually and typically bone marrow surrounded by bone. There was a rich capillary network with endothelial lining between which were numbers of lymphocytes, leucocytes, myelocytes, and giant cells, beside developmental forms of red blood-cells. The bone was lined with periosteum and endosteum.

Four instances of sudden death from insufficiency of the adrenals were observed by Steiger (Correspondenzbl. f. schweizer Aerzte, Apr. 7, 1917). Though no symptoms of Addison's disease in 1 case, the autopsy revealed cheesy degeneration in both adrenals. This was also true of the adrenals in the other cases, but all of these presented the typical picture of Addison's disease. Sudden death in 2 followed physical exertion. Physical exertion or emotional stress may in such cases, use up large amounts of adrenin, and the blood-pressure consequently drops suddenly through the entire cardiovascular apparatus. In experiments on animals such a sudden drop in the blood-pressure entails instantaneously the collapse of the heart, and usually through fibrillation of the ventricles.

hypoadrenia, terminal, i. 436

Diagnosis, i. 436.—Lesne and François (Paris Médical, June 29, 1912) observed in newly born infants suffering from *erysipelas* and other infections a syndrome consisting of vomiting, a green diarrhea with retraction of the abdomen, an erythematous rash, and profound asthenia, leading to algid collapse. The only lesion found at autopsy in such cases was an hemorrhagic distention of the adrenals.

V. Hutinel (Arch. de Méd. des Enfants, March, 1915) points out that the symptomatology of the terminal hypoadrenia in the various infections, *measles, diphtheria, erysipelas, scarlet fever* and others, is virtually identical in all, asthenia, low blood-pressure, prostration, hypothermia, vomiting, pain in the epigastrium, though two or more of these symptoms may dominate the picture. Daily doses of 12 to 20 minims of adrenalin daily in such cases, cause the disease to lose its menacing character as regards cardiac arrest.

Out of 100 soldiers suffering from *bacillary dysentery,* Remlinger and Dumas (Annales de Méd. de Paris, Dec., 1915) observed 4 who suddenly showed hypothermia, cyanosis, heart weakness, and other phenomena suggesting the algid stage of cholera. The autopsies proved the correctness of the assumption that the adrenals were the cause of the symptoms.

The two most prominent symptoms of terminal hypoadrenia in *typhoid fever, acute nephritis, pneumonia, scarlet fever,* and *diphtheria* found by Dumas and Hervier (Bull. et mém. de la Société méd. des Hôp. de Paris, 1913) were a sudden fall of blood-pressure and extreme prostration but hypothermia, vomiting, a profuse green diarrhea, and an erythematous rash were also commonly observed. The adrenal lesions were found to differ, being either hemorrhagic, or granulofatty, and ending in necrosis.

Paisseau and Lemaire (Acad. de Méd., Oct. 17, 1916; Monde Méd., Jan., 1917) observed 3 cases of sudden death from *pernicious malarial fever* in soldiers. In all 3 cases there was hypotension coinciding with maintenance of regular cardiac rhythm. In 1 of the cases the suprarenal white line pointed out by Sergent was clearly identified. In all 3 cases there were found lesions of the adrenal cortex.

Pathology, i. 436.—Anatomico-pathological studies of the adrenals in 42 children, 29 of whom had died of diphtheria and the rest of other infections, by Moltschanow (Rev. del Circ. Med. Argentino, Nov.-Dec., 1912) convinced this investigator that these organs are invariably the seat of lesions, and that the gravity of the latter depends more upon the intensity of the attack than upon its duration or associated infections.

The influence of *diphtheria* toxins upon the secretory activity of the adrenals is well shown by the experiments of Tscheboksaroff (Berl. klin. Woch., June, 1911), in which poisoning of an animal with diphtheria toxin was found to cause, at first, an increased proportion of adrenalin in the blood and subsequently a gradual decrease until total disappearance of the adrenal principle had occurred. In a comprehensive experimental study of the influence of acute infections upon the adrenals Reich and Beresnogowski (Beitr. zur klin. Chirurgie, May. 1914) found that *acute peritonitis* showed a very marked reduction of adrenalin, and that in 50 per cent. of the cases of this disease examined *post mortem*, the adrenal cortex showed marked histological lesions. The authors conclude that acute peritonitis takes the lead among infections in the production of adrenal lesions, a fact which explains the circulatory failure so marked in this disease.

Treatment, i. 441.—Josué (Paris méd., Jan. 6, 1917) recalls that the essential symptomatic triad of adrenal insufficiency in asthenia, low blood-pressure, and Sergent's white line. In some cases adrenal insufficiency constitutes the entire clinical picture and seems primary; yet often close examination reveals a causative infection, at times very slight, *e.g.*, a mild throat inflammation or intestinal infection. Other forms comprise the *adrenal overstrain of soldiers;* the adrenal insufficiency of infections, such as *typhoid, diphtheria,* and *tuberculosis;* that due to *alimentary or other forms of intoxication;* that of *cardiac dilatation.* The solar syndrome (skin discoloration and lumbar pains), the latter due to involvement of the pericapsular nerve ganglia, may also be present. In such cases, **extracts of the total gland** sometimes prove distinctly superior to the pure adrenalin otherwise used. Both these products, repeatedly given, exert a regenerating action on the adrenals. Their hypodermic and oral administration is free from the danger of causing arterial atheroma. **Adrenalin** by mouth gives good results provided it is used in sufficient amounts—1 to 4 and even 5 c.c. (16 minims to 1 or 1¼ drams) of the 1 : 1000 solution a day, divided into two intervals. Three c.c. (48 minims) may be thus given daily for a month or more without harm. For hypodermic use the dose is 0.5 to 2 c.c. (8 to 32 minims) a day, 0.5 c.c. being preferably not exceeded as the single dose. Such injections are generally more or less painful. Slow absorption of adrenalin is secured by injecting under the skin 250 to 500 c.c. (½ to 1 pint) of normal saline solution to which 1 c.c. (16 minims) of adrenalin solution has just been added. The skin is usually blanched at the point of injection and the adrenalin is only with extreme slowness absorbed through the contracted vessels. The pain attending this procedure is prevented by adding 0.01 Gm. (⅙ grain) of **novocaine** to the solution. The injections may be continued for several days. **Extracts of the whole adrenal** may be given orally in daily amounts of 0.2 to 0.4 Gm. (3 to 6 grains), divided into 0.1- to 0.2- Gm. (1½ to 3 grains) doses, or hypodermically in a daily amount of 0.1 Gm. (1½ grains).

adrenal gland in, i. 411

adrenalin in, i. 442, 443

To ascertain the most efficient dosage of adrenalin to counteract cardiovascular failure in *pneumonia, typhoid* and *paratyphoid fever,* Mansvetova (Roussky Vratch, July 4, 1914) compared the effects of various doses in 30 patients. She found that 0.5

c.c. (8 minims) of **adrenalin** caused a moderate rise of blood-pressure which could be sustained by repeating the dose hypodermically every hour or hour and a half. This dose was found to be the most efficient for infectious diseases. Rohmer (Münch. med. Woch., June 16, 1914) in the hypoadrenia of *pneumonia, diphtheria,* and *typhoid fever,* found a combination of *pituitrin* and *adrenalin,* 0.25 c.c. (4 minims) of the former, and 0.5 c.c. (8 minims) of the latter, intravenously in young children and twice these doses in older children restored failing circulation more actively than all other agents. This confirmed the results of Kepinow, who had previously urged this combination.

Sergent (Bulletin de l'Acad. de Méd., Sept. 7, 1915) calls attention to the morbid effects of the hardships of the European War as causes of hypoadrenia, through traumatic *shock, major injuries, typhoid fever, typhus, cholereiform diarrhea, Asiatic cholera, chloroform* anesthesia, *exhaustion,* etc. Such cases are not met by 10 to 15 drops of **adrenalin** 1:1000 solution. He gives 1/30 to 1/20 grain (2 to 3 milligrams) divided into 4 to 6 doses hypodermically, and in addition 1/60 to 1/30 grain (1 to 2 milligrams) orally. He is convinced of having successfully combated collapse with such doses which otherwise would have ended fatally.

The morbid influence of the lesions caused by *diphtheria* in the adrenals is well shown by a case reported by Hoke (Wiener med. Woch., Oct. 2, 1913), in which, after this disease at the age of 14 years, the patient was subject to asthenia, sweating on slight effort, vertigo and "palpitations." At 32 the skin became pale and clammy, the pulse extremely weak, though rhythmic and slow, 52, and the temperature low, 35.8° C. (96.4° F.). An injection of 0.5 c.c. (8 minims) of **adrenalin** caused the symptoms to disappear in 15 minutes. Subsequent treatment on the same lines caused permanent improvement.

If adrenal insufficiency arises during the progress of *diphtheria,* Comby (Arch. de Méd. des Enfants, Jan., 1911) advises combining **adrenal opotherapy** with **serotherapy.** If *syphilis* is also present, **adrenal opotherapy** may be associated with **mercurial** treatment. In the other *infectious diseases,* where no specific medication exists, opotherapy should be begun from the beginning of the symptoms of suprarenal insufficiency. **Adrenalin** may be given by the mouth, or, if the hypodermic method is used, 1 c.c. (16 minims) of a 1:1000 solution is added to 50 Gm. (1⅔ ounces) of **normal salt solution** and injected into the subcutaneous tissue. As this medication is inoffensive, it can be continued daily until the accidents of suprarenal insufficiency have disappeared.

Blaud's pill in, i. 443
pituitary in, i. 441, 443
saline solution in, i. 442, 443
serotherapy in, i. 443
strychnine in, i. 443
thyroid gland in, i. 443

tuberculosis of, see Addison's disease.
tumors of, i. 466, 471; ii, 763

A striking feature of tumors of the adrenals is their influence upon sex characters. This is common to many growths regardless of their nature. Thus, a large **fibrolipoma** of the adrenals among other abnormalities found *post mortem* had produced in a woman of 62 observed by Tuffier (Bull. de l'Acad. de Méd., May 26, 1914) changes which he described as *adrenal virilism, i.e.,* striking masculine characters. A thick black beard and moustache, a masculine face and voice, great muscular development, with fondness for hard manual labor, digging, etc., and conversion of the clitoris into a penile organ, had all developed gradually since the age of 30. Galais (Société de Psychiatrie de Paris, March 21, 1912) describes 3 similar cases, 2 due to *hyperplasia* and 1 to *epithelioma* of the adrenal cortex. Changes such as the foregoing occur, according to the author, only in the female. Thus while a boy suffering from a sthenic growth, *i.e.,* before the tumor breaks down, may grow very large, and Herculean muscularly, the sexual organs being as large as those of an adult, which such child may resemble, a girl will undergo similar exaggerated development only for a while, then gradually assume masculine characters such as those described above. A case of hermaphroditism of this type was also described by Auvray (Rev. de gynéc. et de chir. abdom., Apr., 1912) due to an *adeno-angeio-lipoma* of the left adrenal which had attained the size of a cocoanut. Under Hypernephroma in the foregoing pages various examples of the same kind are recorded.

adenomata, ii. 763

An interesting observation was recorded by Michon (Progrès Médical, Jan. 3, 1914) in the case of a man of 62 in whom a large adenoma of the left adrenal was found *post mortem.* Besides the presence of a tumor in the left hypochondrium, urinalysis showed as only symptom a notable increase of urea excretion, although the patient's diet was very poor in nitrogen. This indicates anew the influence of the adrenals upon general metabolism.

cancer of, i. 466

Frew (Quart. Jour. Med., Jan., 1911) points out that sarcoma of either adrenal, with metastases in the skull observed in children, shows 2 entirely different syndromes and morbid appearances, according to which suprarenal is the seat of the primary growth. On the left side secondary deposits occur in the liver, in the ribs, and cranial bones, and in the thoracic duct and some of its tributaries. On the right side the primary growth usually attains a larger size, and more frequently remains localized to the abdomen. It tends to involve the kidneys by direct extension into their pelvis, stretching out the kidney substance over it, but as a rule being easily separated. Deposits in the cranial bones often lead to exophthalmos, and this usually occurs first on the same side as the primary growth. Ecchymoses into the eyelids may occur and lead to confusion of the disease with chloroma and infantile scurvy.

According to Israel (Deut. med. Woch., Jan. 12, 1911), malignant adrenal and renal tumors can run a febrile course wholly independent of any fever producing complications. It may make its appearance at various stages of the disease as initial, intercurrent, or final fever. It is present in all varieties of malignant neoplasms regardless of their histological structure.

cysts of, i. 453

Such growths according to H. E. Pearce (Trans. West. Surg. Assoc.; Surg., Gynec., and Obstet., Feb., 1917), are due to the tendency of the adrenals to hemorrhage. Fourteen cases are reported in literature, of which 7 were *post-mortem* reports or complications of other adrenal tumors. The other cases were well-defined blood-cysts of the adrenal glands. The author reports the case of a waitress with a history of right side pain of a cramping nature, on several occasions—she thought 5 or 6. A large tumor was present in the upper right abdomen; shock, pain, difficult breathing, rapid pulse—7.30 P.M. 80°, 8.30 P.M. 100°, 9 P.M. 120° 9.30 P.M. 140°.

Operation showed a cyst covered with peritoneum attached to the back above the right kidney. All organs were displaced by the cyst, which was as large as an adult head. The patient recovered, and was well 1 year later.

A *blood-cyst* filling the entire upper abdomen was successfully removed by Küttner (Beitr. z. klin. Chir., Dec., 1912) from a woman of 43. This enormous tumor was back of the peritoneum, and its removal was facilitated by tapping, releasing a quart of brownish fluid. The patient convalesced rapidly, although the operation had been long and tedious on account of adhesion of the cystic *adrenal* to adjacent organs. He found 11 cases in the literature with 5 recoveries.

Bourcy and Legueu (Jour. d'Urol., Feb., 1912) describe a case in a patient of 61 years. There was a large, painful, left sided, abdominal tumor. At the operation a *lymphangiomatous adrenal cyst* holding 5 liters (quarts) was found which practically surrounded the kidney. Pressure of the large number of sympathetic nerves found in the vicinity of the cyst gives painful symptoms.

Out of 10,000 cases of *hydatid cyst* that came under the notice of Nicaise (Bull. med., Nov. 15, 1911) in the course of researches on echinococcic involvement of the urinary organs, 6 cases of hydatid cyst of the adrenals were met with. Three were due to the Bavarian-Tyrolese form of echinococcosis and three to the ordinary form. Four times the involvement was on the right side of the body, twice on the left. In none of these cases had manifestations of adrenal insufficiency appeared during life, the lesions being found at autopsy.

hemorrhagic pseudocysts of, i. 453
  extirpation in, i. 456
  lumbar incision in, i. 456
sympathetic tumors of.

In reporting 4 personal cases of tumors in the sympathetic nervous system and of the adrenals Harbitz (Norsk Mag. f. Laegevid., Jan., 1915) states that there are nearly 30 cases of true *neuroma* on record, almost all being in the sympathetic nervous system. This form of tumor does not generally incline to infiltration or metastasis. The malignant type of ganglioneuroma occurs only in children, as a rule, such tumors seeming to be less malignant in adults. A third type of tumors belonging in the category under discussion are the so-called paragangliomas or chromaffin tumors, located in the medulla of the suprarenals or carotid gland, of which from 12 to 15 cases have been published. They are typical epithelial tumors on the borderline between benign and malignant growths.

Monro and Dunn (Glasgow Med. Jour., Aug., 1914) report a case of *malignant ganglioneuroma* of the left suprarenal in a boy 3½ years old. About 6 months after the beginning of his ill health, there was marked pallor of the face, and large veins were seen on the forehead. The limbs were emaciated. A large mass was found in the situation which an enlarged spleen might occupy, but the anterior edge was thick and rounded and the mass extended more transversely than if it were a spleen. It was firm and easily movable. The hemoglobin was forty-eight per cent., erythrocytes 2,020,000, leucocytes 4,000; urine normal.

J. S. Dunn (Jour. of Pathol. and Bacter., Apr., 1915) also observed an adrenal ganglioneuroma in a boy, aged 14, who died after an illness of three months' duration characterized by wasting, pain in the back, ascites and great enlargement of the liver. At the post-mortem examination a large oval tumor measuring 15 cm. in length, 10 cm. in breadth and 7 cm. in thickness, was found occupying the site of the right suprarenal body. He gives a table of the 51 cases, already described, including his own. In 42 cases in which the age is given, 16 were in the first decade, 9 in the second, 4 in the third, 8 in the fourth, 2 in the fifth, while in 3 cases the age was over 60. The sympathetic system particularly the main chains and their abdominal branches, are their main sites. Whereas the majority of these tumors are solitary, some groups consisted of as many as 160.

syphilitic tumors of.

Bériel, Durand and Malespine (Lyon Méd., Dec. 7, 1913) report a unique case in which a large *gumma* was found in the center of the right suprarenal at autopsy. The left suprarenal showed compensatory hypertrophy.

Adrin, see Animal Extracts: Adrenals, i. 755
Adult chorea, chronic, iii. 332
Adynamia, camphorated oil injections in, ii. 729
  general, thyroid gland in, i. 751

Adynamic functional disorders, caffeine in, iii. 524
Aërated waters, vi. 709
Aërocystoscope, Kelly's, vi. 230
Aërophagia, viii. 355
Aëroplane sickness, vii. 733
Affusions, viii. 812
After-pains, antipyrin in, ii. 44
  camphor in, ii. 732
After-turning nystagmus, v. 686
Agalactia, vi. 569; see also Mammary Gland, this Index.
Agar-agar, i. 481

Loeper and Barbarin (Paris Méd., Sept. 23, 1916) recommends pads of agar, or agar tied in the center of a square of gauze, for the dressing of wounds, being very compressible and elastic. It absorbs 8 times its weight of water, and dries extremely slowly, while microbes and leucocytes accumulate in it.

Agaricin, i. 481
Agchylostoma, see Hook-worm, vii. 310
Agglutination test, i. 482

A simplified agglutination test is recommended by Liebermann (Deut. med. Woch., Dec. 10, 1914). By drawing the blood direct into distilled water the corpuscles are destroyed, and the clear fluid left can be used just as well as the serum alone. Two drops of blood are drawn into 1 c.c. of distilled water. One drop represents about 0.05 c.c. serum, and the dilution is about equivalent to 1 in 20. To the limpid red fluid 1 c.c. of saline is added, then dilute with saline sufficient to make up 1 c.c. each time. Control tests with the ordinary technic confirmed in every respect the reliability of this simplification of the Widal test.

After an experience in 275 patients, Donaldson and Clark (Lancet, Sept. 23, 1916) emphasize the need for repeated agglutinations at intervals in the case at least of persons previously inoculated. They do not think that any diagnostic inference can be drawn from a consideration of the titer in inoculated persons, in cases in which only one examination has been made, as individuals vary so diversely in their agglutinin response to infection or inoculation.

The agglutination test for typhoid, paratyphoid A, or paratyphoid B, infection has not lost its diagnostic value as the result of prophylactic inoculation against these infections, according to Walker (Lancet, Nov. 25, 1916). The only changes inoculation has produced are the need for the adoption of accurately quantitative agglutination tests, the use of a standardized agglutinable culture, and the need of repetition of the tests to determine the curve of agglutination.

Baerthlein (Münch. med. Woch., Oct. 31, 1916) observed a multiple or para-agglutination of the saprophytic germs with various germs—those of the cholera vibrio, typhoid or paratyphoid, Flexner or Y dysentery bacilli in various combinations, etc. In 1 case, for example, there was agglutination for cholera at 1:50, for typhoid at 1:200, and for dysentery bacilli at 1:100, with marked agglutination of certain bacteria found which are not usually regarded as pathogenic.

Hempl (Jour. of Immunology, Feb., 1917) made intracardiac, and, in 2 cases, intravenous injections of an agglutinin so strong that it could be detected in minute quantities. He found that in general a foreign serum disappears more quickly from the blood of an animal sensitized to that serum than from that of a normal animal. It disappears more quickly from the blood of highly reacting animals than from that of slightly reacting animals.

Agoraphobia.

This term is applied to a variety of obsessions in which fear of not being able to cross an open space, a room, street, square, etc., predominates. The patient carries out the act, however, when compelled to do so, or in company. He may be quite normal otherwise, though condemned to a sedentary life. It is often associated with acute neurasthenia, and occasionally with the chronic form.

Agraphia, ii. 48, 51, 55
Agrypnia, trional in, viii. 590
Ague, see Malarial Fevers, vi. 477; also this Index.
  brow, vi. 479
  dumb, vi. 479
Ague-cake, vi. 471, 526; viii. 305
Agurin, i. 483
Ainhum, i. 483
Air-conduction of sound, v. 684, 685
Air embolism, iv. 440
Air-passages, inflammatory disorders of, petroleum in, vii. 413
Airol, i. 485
Aix douche, viii. 812
Akoria, viii. 341
Alalia, see Aphasia, ii. 47
Albargin, i. 486
Albaspidin, see Aspidium, ii. 211
Albee's method in tuberculosis of the spine, viii. 274
Albert's keloid, see Keloid, viii. 168
Albinism, vi. 61
Albuminuria, i. 486

Etiology, i. 488, 497.—Of 528 soldiers observed by M. Laber and P. Lauener (Correspondenzbl. f. schweizer Aerzte, July 24, 1915), 56, or 10.6 per cent., had albuminuria. The amount of albumin was small in the great majority. To determine the influence of work and rest on the excretion of urine, the latter was examined immediately after work, and in the morning after a night's rest. It was found to be present in 11.5 per cent. after working, in 7.9 per cent. after rest.

Engel (Deut. med. Woch., Nov. 23, 1916) examined the urine of every soldier admitted to the surgical hospital in his charge, a total of 3,210 men. Albumin was found in 13 per cent. but never in large proportions.

Schiff (Wiener klin. Woch., May 28, 1914) placed on record several cases that showed a transient albuminuria after lavage of the stomach, although nothing of the sort was present before. Marcozzi (Folio Urologica, Feb., 1914) has observed that albuminuria is of fairly constant occurrence in patients who have acute or chronic suppuration. If an abscess is deep and under considerable pressure, albuminuria is more likely to occur. If the abscess is drained, the albuminuria disappears.

Orthostatic or Postural.—Stirling was the first to call attention to intermittent albuminuria in children in connection with the position of the body, and he styled it *"postural albuminuria."* Jeanneret (Arch de Med. des Enfants, Sept., 1915) holds that this is the best name for it, as neither the orthostatic nor the lordotic attitude ever induce it except in the predisposed. Of the 204 children examined, albuminuria could be induced by lordosis alone in only 3 per cent., and by a change from the seated to the erect posture (orthostatism) only in 1.3 per cent. Both together, the children not keeping still, induced albuminuria only in 1.6 per cent. The findings in the various groups listed show that the restlessness of children responds to a physiologic demand, and that children should not be expected to sit still in school. The school desk should be arranged

Nicholson (Pract., xciii. p. 113, 1914) in a study of orthostatic albuminuria among 189 healthy English school boys, found that 7.5 per cent. showed albumin on arising, 7 per cent. after breakfast, 10.7 per cent. after football, and 18 per cent. after a three-mile run. Bugge (Norsk Mag. f. Laegevid., lxxiv, No. 12, 1913) found orthostatic albuminuria in 14.9 per cent. of 1076 school children in Christiana. It was much commoner among the girls than among the boys, the figures being 13.3 per cent. and 3.5 per cent, respectively. According to L. Jehle (Wiener klin. Woch., Feb. 27, 1913) orthotic albuminuria due to pathological lordosis can be removed immediately by having the patient bend one leg at right angles to the hip and knee, and supporting it thus by some device. After retaining this position for 10 to 15 minutes even severe albuminuria disappears. This procedure serves to distinguish the orthotic from the nephritic albuminuria. It has been claimed that orthostatic albuminuria is often a sign of tuberculous infection somewhere in the body. Reyher (Monats. f. Kinderheilk., xii, 82, 1913; Pediatria, vi, No. 1, 1914) investigated 20 cases of orthostatic albuminuria and was in every case able to find tuberculosis. Prolonged observation, history, and physical examination with a temperature record, X-ray plates, and von Pirquet test were used. Arnold (Münch. med. Woch., lx, No. 9, 1913) believes that orthostatic albuminuria is merely a sign of a general infection and is by no means pathognomonic of tuberculosis. He found no orthostatic albuminuria in 44 cases of chronic skin tuberculosis.

Holst (Norsk Mag. f. Laegevid., Nov., 1915) examined *post mortem* the kidneys of a youth of 16 who had had typical orthostatic albuminuria during the last 5 or 6 years, but who had been otherwise in normal health until he contracted "galloping tuberculosis" of the lungs. Not a trace of inflammation could be discovered in the kidneys. He reports also 10 clinical cases in which orthostatic albuminuria was a chronic condition, but in which no tubular casts were ever found. On the whole, while albuminuria may coincide with tuberculosis, orthostatic albuminuria cannot be deemed an indication of this condition.

Gaisböck (Med. Klinik, Jan. 25, 1914) noticed irregular or intermittent pulse in all of the 11 cases he reports of orthostatic albuminuria. The patients were from 14 to 30 years old, about half being over 20. Albuminuria developed in all when they assumed the lordosis position, and tube-casts also appeared in the urine in some under these conditions. M. H. Bass and H. Wessler (Arch. of Intern. Med., Apr., 1913), from a study of 36 cases with the aid of the orthodiagraph, conclude that in a series of cases of orthostatic albuminuria, selected at random, a considerable number will present evidence of relative cardiovascular insufficiency. In an exhaustive study of several patients Fischl and Popper (Boston Med. and Surg. Jour., May 4, 1916) noted that the condition appeared in the strong and well-developed as well as in the weak and anemic types. They are inclined to believe that the explanation is to be found in a mechanical cause, resulting in congestion of the renal vessels, together with a local and general predisposition. **Supporting apparatus** by improving the posture, gave good results.

iron in, vi. 86
methylene blue in, vi. 686
tests for, i. 500; vii. 461, 462

Autenrieth and Mink (Münch. med. Woch., Oct. 19, 1915) comparing the quantitative findings by *colorimetry* with other techniques obtained further confirmation of the precision of the colorimeter technique.

[A colorimetric method of quantitative albumin estimation suitable for the practitioner's use is described by W. Autenrieth and F. Mink (Münch. med. Woch., Oct. 19, 1915) as follows: Ten c.c. of clear or filtered urine in a test tube are heated for a few minutes on the boiling water bath. If a precipitate forms, 2 to 4 drops of dilute acetic acid are added and the tube put back in the water bath. Usually at once, but sometimes only after a few minutes, the albumin all comes down in large flocculi. If the formation of the flocculi is difficult because of the urine being poor in salts, 2 to 5 c.c. of saturated sodium chloride solution should be added. The precipitate is then at once placed on moistened filter paper and washed with about 20 c.c. of hot water, the latter having first been used to rinse out the test tube. The precipitate is next placed in a small funnel over a 10 c.c. graduate. Two to 3 c.c. of 3 per cent. sodium hydroxide solution are placed in the test tube to dissolve the remaining traces of albumin, and then over the precipitate itself, most of which easily goes into solution. Additional 2 to 3 c.c. portions of the alkali are now used, until the albumin is completely dissolved and the total amount of solution is about 9.5 c.c. Four or 5 drops of 20 per cent. copper sulphate solution are now added, the graduate filled to the 10-c.c. mark with alkaline solution, and the mixture well shaken up for two or three minutes. After allowing it to stand five or ten minutes, a clear supernatant fluid suitable for colorimetric examination will usually be found; if not, the mixture may be filtered through dry filter paper, the first few drops being discarded. The solution having been placed in the glass trough of the Autenrieth-Koenigsberger colorimeter, comparison is made 5 or 6 times with the wedge-shaped color scale of the instrument until 2 or 3 readings correspond. The final reading is then referred to a curve chart, which shows the number of milligrams of albumin in the 10 c.c. of urine. The method is held to be very accurate. Where the urine is believed to contain less than 1 gram of albumin per liter 20 c.c. instead of 10 c.c. of urine should be used, and where it exceeds 4 grams, only 5 c.c.

In the colorimetric method of Claudius, of Copenhagen, as described by Kahn and Silberman (N. Y. Med. Jour., Oct. 3, 1914) the urine is first filtered and its reaction tested to see if it is neutral or slightly acid. It is then diluted with an equal portion of a 2 per cent. sodium chloride solution. To 5 c.c. of the diluted urine, add now 5 c.c. of Claudius's reagent, which consists of 2 per cent. trichloracetic acid, 0.5 per cent. tannic acid and 0.1 per cent. acid fuchsin. The mixture of urine and reagent is then well shaken in a stoppered 15- or 20-c.c. flask, filtered, and the filtrate compared with a standard in the Sahli or Gowers hemoglobinometer. C. E. de M. S.]

Norgaard (Ugeskrift for Laeger, Nov. 25, 1915) has been giving Claudius's quantitative colorimeter test for albumin a thorough trial in 100 specimens of urine and in some other organic fluids, and found that by comparative tests, with an albumin content below 1 per thousand there may be a difference up to 10 per cent. of the findings on analysis by weight. With an albumin content above 1 per thousand, the difference could rise to 20 or 30 per cent., averaging 2.5 per cent.

Deiters (Münch. med. Woch., Dec. 12, 1916) heats an ordinary test tube until the bottom is sufficiently soft to allow its being pushed up into the tube so as to make a small ball-shaped or conical depression in its lower end. In this are poured 6 to 8 drops of nitric acid and the urine poured on top. The turbidity resulting is more distinct than is obtained with the old test tube owing to the increase of light which passes through the fluid.

For the quantitative determination of albumin in the urine a simple test is recommended by Anderson (Ugeskrift for Laeger, Apr. 26, 1917). He uses a round albuminometer. In this he places the urine and the Esbach reagent and adds thereto 0.1 to 0.2 Gm. of barium sulphate (tungspat); after mixing, the glass is set aside for precipitation. In 4 minutes it is complete. A urine containing over 2 per thousand albumin should be diluted before using the test.

Benedict (letter to the N. Y. Med. Jour., Nov. 28, 1914) describes the following simple method to estimate the albumin: Boil the urine thoroughly, adding 1 drop of nitric acid. Centrifugate until the precipitate is no longer condensed. The percentage reading is about 6 times the percentage by weight of dried albumin. If the moist precipitate is large, say more than 1 c.c. (16 minims) in a 10-c.c. (2½ drams) tube, which rarely happens, even when urine is said to coagulate entirely, the lower portion of the precipitate is still further compressed. This method is simple and rapid, and is reasonably accurate, sufficiently so for clinical use.

A test described by Osmond (Lancet-clinic, Dec. 13, 1913) is asserted by him to be equal in delicacy to any other, and to have certain features which make it superior to them for routine use. The following solution is employed:—

Picric acid	5 parts
Citric acid	10 parts
Sodium chloride	100 parts
Distilled water	1000 parts

Technique.—Place 2 or 3 c.c. of the reagent in a test tube. Filter the urine until it is perfectly clear. Then allow urine very gently to float upon the surface of the reagent in the inclined test tube. Albumin will show as a white zone at the line of contact of the two amber fluids, which are practically iso-chromic. D. W. Prentiss (Med. Council, Aug., 1912) gives the following method to record the amount of albumin in urine in such a way that it can be compared with later examinations in the same case, or with other cases. The record is permanent, easy to make, and sufficiently accurate to be of the utmost value to the busy physician: 1. Make the underlying nitric test for albumin, in a test tube. 2. Allow the tube to stand 2 minutes. 3. Hold the tube between a black or dark object and the eyes, on the level with the eyes. 4. Note the exact thickness of the ring of albumin at the line of contact. 5. On the chart draw parallel vertical lines which represent the test tube. Connect these lines by a cross line the exact breadth of the thickness of the coagulated albumin.

H. E. Jones (Glasgow Med. Jour., Jan., 1916) reports a case in which results of albumin determination in the urine with the Esbach procedure proved misleading, owing to a high degree of alkalinity of the urine tested. Although an albumin precipitate was obtained in the heat and acid tests, no precipitate was obtained in the albuminometer owing to the fact that the amount of citric acid contained in Esbach's reagent was insufficient to acidulate the urine to the extent required for precipitation of albumin by the picric acid in the reagent. In all very alkaline urine this source of possible error in the interpretation of the test should be borne in mind.

Lenk (Deut. med. Woch., Oct. 21, 1915) recommends the following simple test for albumin and sugar in the urine; it is complete in 10 minutes. Albumin, enzymes, etc., are absorbed by negative substances like kaolin, charcoal, pulverized pumice stone, etc. If these are mixed with the urine after addition of Esbach's reagent (a mixture of 5 Gm.—75 grains—picric acid with 10 Gm.—2½ drams—citric acid in 500 c.c.—1 pint —water) as the particles settle to the bottom of the dish they carry the albumin down with them. This proceeds more rapidly the heavier the substance. He uses pulverized pumice-stone; this drops rapidly to the bottom of the dish and carries the albumin with it, so that in 10 minutes the albumin is precipitated as completely as not until after 24 hours by the usual technic.

Andresen (Ugeskrift f. Laeger, Apr. 6, 1916) has given Lenk's method a thorough trial and found it more dependable than other technics if temperature, interval, etc., are uniform.

An improved technic for Tsuchiya's phosphotungstic-hydrochloric acid-alcohol reagent for detecting albumin in the urine is offered by Sueyoshi (Mitteil. a. d. med. Fakul. d. k. Univ. Tokyo, xiv, No. 3, 1915). The reagent is a mixture of 20 Gm. mercuric chlorid; 5 Gm. potassium bromid; 10 c.c. hydrochloric acid (30 per cent.); water 55 c.c. and alcohol (95 per cent.) to 100 c.c. The test tube is filled about half full of urine and about seven-eighths as much of the reagent is poured in and thoroughly mixed with it. The albumin sediment is measured next day as usual.

Lewin (Med. Klinik, July 13, 1913) emphasizes the delicacy and reliability of the color reaction which follows when dissolved albumin is treated with a mixture of 0.1 to 0.15

parts trioximinomethylen in 100 parts crude sulphuric acid. Even a 0.02 per cent. solution of egg albumin shows the characteristic violet tint.

M. B. Katzenstein (Jour. Amer. Med. Assoc., Mar. 4, 1911) recommends, in the heat and in the contact tests for albumin, the passage of light rays through the urine and observing it at right angles to the rays—the principle being the same as seeing particles of dust in a ray of sunshine. Very minute quantities of albumin can be detected.

cardiac, potassium cobaltonitrite in, vii. 585

of pregnancy, calcium lactate in, ii. 716

Its relations to pregnancy have received some attention. Lepage's (Annales de Gynéc. et d'Obstét., Nov., 1912) extensive clinical experience has shown that a woman who has had symptoms of pregnancy intoxication once, especially at the first pregnancy, should be supervised with special care during succeeding pregnancies, from the earliest months onward. When the intoxication was severe enough to bring on convulsions or premature separation of the placenta compelling interruption of the pregnancy or killing the fetus, the woman should have her urine examined for albumin at least once a week, and the amount and quality noted. The writer suggests that the patient can be trained to do this herself. Once a month, especially during the three last months of the pregnancy, a complete analysis of the urine should be made. Williamson (Lancet, May 17, 1913) believes that a condition of acidosis of the urine and blood is found constantly in cases of pregnancy toxemia when the lesions are of a certain severity, while it is not found in cases of chronic nephritis, even when the symptoms are very severe. The onset of an acidosis in the course of a chronic nephritis in pregnancy may be interpreted to mean that toxemia has been added to the existing lesions. These tests, however, fail in many of the earlier and slighter cases. The writer accepts the recent view that the source of the toxines can be definitely stated to be the trophoblastic layers of the chorionic epithelium.

Slemons (Amer. Jour. of Obstet., May, 1913) holds that 1 of every 5 or 6 women who have had a high grade albuminuria in the first pregnancy will suffer from autointoxication in the second. This does not include cases of mild and temporary albuminuria.

induction of premature labor in, vii. 636

Prognosis, i. 499.—H. W. Cook (Jour. Amer. Med. Assoc., Feb. 28, 1914) holds that in insurance applicants over 40 or 45 it is of great importance to determine the presence or absence of a slight albuminuria. The slighter albuminurias are almost constantly overlooked by the average examiner. Apparently the only way to obtain this very vital information is to have the uranalysis made at the home office, although an improvement may be expected from the recommendation to the examiners of a more delicate and simpler test, such as Ulrich's test. From a study of 396 cases, of which 70 were revisited from 10 to 11 years after the first examination, Barringer and Warren (Arch. of Intern. Med., June, 1912) conclude that renal albuminuria without casts is most frequently found in young adults. It is exceptional as a symptom of incipient nephritis. It is rather to be regarded as evidence of a generally lowered resistance which predisposes to tuberculous infection. The mortality among these people is higher than among normal subjects. According to W. Blair Stewart (Lancet-Clinic, July 27, 1912), it is very unwise to jump to hasty conclusions in albumin cases and list them in the organic class. Each case should be held up and studied as not suitable for insurance until such time as they can be declared free from disease or the trace of albumin. Statistics prove that the unstudied cases of this type show a very high mortality. Many cases learn from the insurance examiner for the first time the presence of true or suspected kidney diseases, and this mere fact alone leads the applicant to consult his family physician for aid.

Treatment.—T. C. Janeway (Amer. Jour. Med. Sci., Feb., 1916; N. Y. Med. Jour., Feb. 12, 1916), states that for the most part treatment in the past was purely schematic, based on a conventional diagnosis, and usually involved violent interference with the habits of a lifetime. To tell every patient with albuminuria or hypertension to stop eating red meat, or, worse, to go on a milk diet, is evidence of ignorance. He divides the cases into 5 types.

The *first type* is one in which *albumin and casts in the urine are the only evidence of disease.* If the treatment of acute nephritis results in a steady subsidence of albuminuria, it should be persisted in, just as though the patient had a known acute nephritis, but if a week in bed on a milk diet has no appreciable effect on the albumin and casts, the bed and milk diet are an unwarrantable hardship. In children the question of a *postural albuminuria* should be cleared up without delay. The effect of exercise and cold baths should be studied carefully, as these may cause an albuminuria. Severe physical strain, exposure to cold and wet, and excesses, not only in tobacco and alcohol, but in other things as well, are to be avoided. Soups and spices may wisely be excluded from the diet. Gourmands should have their excessive appetites restrained; obese patients should be moderately reduced; but if the phthalein test is normal he sees no reason for a restriction of protein, either qualitative or quantitative, below a moderate normal intake. Patients who use much salt should reduce it.

The *second type* is one in which *the patients have hypertension with or without a trace of albumin and with slight if any subjective symptoms.* The worst advice for a man of important affairs is to give up business completely, but change of occupation may be imperative for the manual laborer. It is of great importance to secure adequate normal sleep. A short rest in the middle of the day is of great benefit. Tobacco in excess is a poison. While excessive athletics may be dangerous, exercise is beneficial, and when this cannot be allowed for any reason, massage is helpful. Diet should follow about the same lines as in the first class, and the use of salt should be moderate. The abuse of fluid is dangerous and a winter vacation in a warm climate is sometimes desirable.

The *third type* is that in which *hypertension and outspoken myocardial insufficiency* are present. The heart must be safeguarded by rest in bed or in a chair. Those with auricular fibrillation need **digitalis**, those without should also receive the drug, but some of them do not respond as well. Toxic effects must be watched for, as some patients with regular rhythm are made worse by digitalis. Then one of the **caffeine** diuretics should be tried, **theocin,** about 12 grains (0.77 Gm.) a day, or **diuretin,** about 40 grains (2.6 Gm.) in divided doses, not oftener than every other day. The fluid intake and the urine output must be measured accurately. Diuresis from digitalis should not be expected within 48 hours, but that from the caffeine group may be observed on the day of administration and the next doses should be given when the diuresis ceases. The symptoms that demand treatment are dyspnea, edema, and the whole picture of cardiac failure with passive congestion of the viscera; vasodilators are indicated. He speaks highly of **fresh nitroglycerin** tablets dissolved on the tongue and not swallowed. **Theobromine** may be valuable in some cases. **Regulation** of the **diet** and **reduction of fluids and salt** are indicated.

The *fourth type* is one of *general edema without notable myocardial insufficiency.* These patients excrete small quantities of salt, so treatment should always begin with a period of very low salt and water intake to promote rapid absorption of the dropsy. Bed is desirable until normal function is restored, and if the dropsy disappears the further treatment is that of convalescence from acute nephritis. Obstinate edema requires other dehydrating measures, **sweat baths, hot packs,** perhaps **purging.**

The *fifth type* is that of *advanced renal insufficiency.* Treatment is purely symptomatic. Paroxysms of dyspnea and of Cheyne-Stokes breathing demand special relief. **Morphine** is effective in many cases, but may induce anuria with coma. **Chloral hydrate** in 5- or 10- grain (0.3 to 0.6 Gm.) doses, alone or with **bromides,** sometimes is effective. The patients should be encouraged to sleep in a chair instead of insisting that they go to bed. Diet is reduced to a minimum by the patient himself. **Bleeding** has its greatest value in sudden convulsions, when the removal of 500 or 600 c.c. of blood is indicated. **Sweating** occasionally is of benefit.

strontium lactate in, viii. 409

Albumosuria.

Albumose occurs in the urine under various circumstances. It may appear when large quantities of pus, such as in empyema, a large abscess, etc., accumulate in any region; in chronic suppurative processes, intestinal, peritoneal, meningeal, etc.; in pyogenic nephritis, and when there is a considerable destruction of white corpuscles. It may also indicate a more or less rapid tissue disintegration, causd by pathogenic organisms, as in pneumonia, particularly in the resolution stage; hepatic disorders, especially acute yellow atrophy. This form is usually temporary.

In a rare form known as *"myelopathic albumosuria* or *Kahler's disease,"* characterized by a copious excretion of Bence-Jones proteose, the latter is persistent, and is usually associated with sarcomatous degeneration of the bone marrow. This form runs a rapid course and is invariably fatal. A. Graham-Stewart (Clinical Jour. Mar. 29, 1916) observed 3 cases of albumosuria in children due to intestinal toxemia, with mucous colitis in one of the patients. Toxemia of intestinal origin is regarded by the author as an unrecognized cause of albumosuria. He urges the importance of an early distinction between the latter and albuminuria. Heller's test for albumin then gives a bulky precipitate. This does not form with nitric acid so definite a ring as does albumin. It is more woolly and tends to float to the top. It may at once be distinguished from albumin by heating when the ring or cloud disappears to reappear on cooling. Again the ordinary heat test does not cause albumose to form a cloud.

Martindale gives the following tests for the detection of albumoses: Acidulate the specimen with acetic acid, and add 10 per cent. potassium ferrocyanide solution. This precipitates primary albumoses. This ferrocyanide precipitation distinguishes albumose from compound protein. On warming, the precipitate dissolves, to reappear on cooling. This distinguishes it from that due to serum albumin.

Again, after precipitation by salicylsulphonic acid, albumoses dissolve on heating and reappear on cooling.

There is also the Biuret reaction. Albumin is tested for by Heller's test; if present, it is removed by 10 per cent. trichloracetic acid solution and the Biuret test applied to the filtrate. To do this, 1 drop of a 2 per cent. copper sulphate solution is placed in a test tube; 5 c.c. of the urine are added, and then 5 c.c. of a 10 per cent. solution of sodium hydroxide. The presence of albumose is indicated by a rose pink.

As regards the *Bence-Jones form,* Martindale states that this albumose is detected by: Coagulating at 58°

C., *i.e.,* lower than serum albumin, which coagulates at 75° C.; precipitates with hydrochloric acid; precipitates with nitric acid in the cold; on raising to the boiling-point, however, the coagulum dissolves more or less completely, and reappears on cooling; precipitates with potassium ferrocyanide and citric acid (often takes time to develop, differing in this respect from albumin).

The hypochloric acid test is stated to be very sensitive, and not to depend on excess of salts. The result is obtainable after very free dilution of the specimen.

Alcohol, i. 507

Physiological action, i. 511.—*Absorption.*—Hanzlik (Cleveland Med. Jour., Apr., 1913) holds that the incomplete absorption of alcohol is not due to re-excretion, since the intestinal canal excretes a much smaller quantity (0 to 0.14 Gm.) than that which remains in the intestine when absorption is arrested. The absorption of alcohol differs for different individuals of the same species, but the average was practically the same in the different animals studied, *i.e.,* cats and dogs. The extent of intestinal surface does not affect its absorption. The absorption is about the same for all divisions of the small intestines, although slightly higher in the stomach, and greatest in the colon.

The effect of alcohol on respiration was studied by Higgins (Jour. Pharm. and Exper. Therap., May, 1917) on recumbent and breakfastless men. From 30 to 45 c.c. (1 to 1½ ounces) of ethyl alcohol (suitably diluted) were given. The respiration rate was not appreciably affected by alcohol nor was the type of respiration changed, unless there was restlessness. The heat production, as indicated by the oxygen consumption, was ordinarily unchanged; in about one-fifth of the experiments there was a rise in heat production of from 5 to 7 per cent. It diminished the volume of air breathed per minute in most instances.

Nutritive Value.—Higgins (Amer. Jour of Physiol., Aug., 1916) studied the nutritive value of alcohol and some sugars by determining the respiratory quotients in periods of 3 and 4 minutes' duration on fasting subjects. He found that (*a*) alcohol begins to be burned in appreciable quantity in from 5 to 11 minutes after taking; with some subjects the combustion began more quickly than with others; (*b*) sucrose, lactose and levulose begin to be burned quite as soon as alcohol, if not sooner; (*c*) glucose and maltose are not utilized as food as soon as the other sugars or alcohol, approximately 20 to 30 minutes elapsing before their combustion plays an important part in the metabolism.

Blood.—In a study of the reduction by alcohol of resisting powers of red corpuscles, Fillinger (Deut. med. Woch., May 23, 1912) examined the blood of 2 healthy young men before and after drinking champagne, and found the resisting power of the reds in 1 case much reduced thereafter for a time; the resistance quotient (Liebermann) dropped from 88 to 43 in an hour. Rabbits and a dog gave the same result. Weinberg (Roussky Vratch, Aug. 11, 1912) employed Liebermann and Fillinger's method to determine the resistance of the erythrocytes to hemolysis, following the ingestion of alcohol, and found that a guinea-pig given enough vodka for intoxication showed complete hemolysis. A man weighing 60 kilos consumed before dinner 450 c.c. (15 ounces) of champagne; 20 per cent. of his erythrocytes lost their resistance to the sodium chloride solution. Yet another man who was an habitual drinker showed no effect from a similar quantity.

C. C. Lieb (Trans. Amer. Med. Assoc.; N. Y. Med. Jour., June 9, 1917) studied the action of alcohol on the isolated mammalian heart, normal rabbits being used. The hearts were perfused with Ringer's solution containing 0.1 per cent. dextrose. The addition of alcohol to the perfusion fluid in such amounts as to make $\frac{1}{50,000}$ dilution had no effect on the heart's action. Higher concentrations always resulted in depression. The strength of the beat was, with one exception, always lessened. Generally there was also a decrease in the rate. The depression was not completely removed by a subsequent perfusion with fresh Ringer dextrose. Other series of experiments showed that exhausted hearts and those from animals suffering from distemper were not stimulated by the perfusion with alcohol, but in every case were depressed.

[Our Associate Editor, Professor S. Solis-Cohen, held that isolated heart experiments were of very little value in relation to the clinical use of alcohol, and while it was undoubtedly true that under such conditions the drug depressed the heart it was equally certain that, taken in moderate amounts, alcohol clinically did increase the force and rate of the heart. It was also pointed out that the reactions of different persons to drugs varied widely, depending largely upon the condition of the vegetative nervous system. This was true of alcohol as well as of other drugs, and for an estimate of its clinical value all of these facts had to be considered.

My own impression concerning isolated heart experiments, is that they are utterly worthless and misleading when the effects of any remedial agent, other than those of the organ's normal stimulants, the adrenal secretion and the constituents of the blood and its cells are studied. C. E. DE M. S.]

Blood-pressure.—Though whisky, according to C. C. Lieb (Jour. Amer. Med. Assoc., Mar. 13, 1915) raises for a few moments the systolic blood-pressure, and thus acts as an apparent circulatory stimulant, it decreases secondarily cardiac efficiency, raises disproportionately the diastolic pressure, and lowers the pulse pressure.

Nervous System.—Marchiafava was the first to call attention to primary degeneration of the nerve fibers in the corpus callosum and commissure in men with alcoholic psychoses, according to Guizzetti (Riforma Medica, Apr. 24, 1915). The clinical picture in this condition is that of a gradually developing feeblemindedness, with perversion or deadening of the moral sense; there may also be tremor and disturbances in speech, etc.

Muscular System.—At the Nutrition Laboratory of the Carnegie Institution an exhaustive experimental study of the physiologic consequences of the ingestion of small doses of ethyl alcohol in man showed that, according to F. G. Benedict (Jour. Amer. Med. Assoc., Apr. 29, 1916), it induced no facilitation of the motor processes, but that the depression of the simplest forms in the finger and eye movements seemed to be one of the most characteristic effects of alcohol. It is exactly these effects which were found to harmonize most closely with the average of all the effects for the several subjects studied.

Heredity.—Ingested alcohol enters all tissues and secretions. The milk, in particular, contains it, even where the amount taken has not been sufficient to cause "intoxication." Experiments conducted by M. Nicloux (Presse méd., July 19, 1913) showed that alcohol passed freely into the secretions of the male reproductive organs as well as into the blood of the fetus from that of the mother. Such findings permit of readily accounting for what is clinically known as "alcoholic heredity," which has for its consequences premature births, abortions, high infantile mortality, and later, physical and mental degeneration. C. R. Stockard (Arch. of Intern. Med., Oct., 1912) gave guinea-pigs alcohol by inhalation to the point of beginning intoxication for 1 hour at a time, 6 days a week. Forty-two matings of alcoholic guinea-pigs gave only 18 young born alive, and of these only 7 (5 of which were runts) survived for more than a few weeks. Nine control matings gave

17 young, all of which survived and were normal, vigorous individuals.

Psychic Co-ordination.—T. B. Crothers (Nashville Jour. of Med. and Surg., June, 1913) states that an analysis of the causes of accidents on railroads and with motor cars brings out the fact that in over 50 per cent. of these cases alcohol is the responsible cause. One authority traced 200 accidents occurring with motor cars, a large part of which were attended with fatality, to the use of alcohol just before the accident. In most of these cases the drivers were not intoxicated, or supposed to be under the influence of spirits.

Immunity.—W. J. Brickley (Boston Med. and Surg. Jour., May 13, 1915) concludes that alcohol causes accidents, obscures the diagnosis, increases the danger of infection at the time of the accident, prevents adequate treatment, increases the danger of intercurrent complications, retards the process of repair, gives a poorer end result, and increases the mortality in accidents.

Substitutes.—The legal suppression of vodka in Russia has introduced the use of many such. Krivonossoff (Roussky Vratch, No. 46, 1915) states that during 1914, in two of the large hospitals of Kazan, 1052 cases of intoxication were registered. In 23 per cent., that is, 240 cases, the poisoning was due to denatured alcohol, varnish or Cologne water. All kinds of trades and ages (below 10 and up to 70) were represented. About 50 per cent. of these patients were between 20 and 30. Of 45 ward patients, 30 died, of whom 19 succumbed during the first twelve days; 8 died on the second day, and 3 on the third. According to Kuznetzoff (Russky Vratch, Feb. 14, 1915) the number admitted to one large hospital had reached 1292 by the end of the year, namely 861 cases of poisoning from denatured alcohol and 382 from varnish and 48 from both combined. In 144 cases the patients were between 15 and 20; there were 2 aged 14, and one child of 12. There were 11 deaths from the denatured alcohol, all within the first 24 hours, and 4 in the varnish cases.

Referring to the use of substitutes for liquor, Billström (Hygiea, lxxvii, No. 23, 1915) states that it would be better to denature with an emetic rather than with the substances now used. In the lower classes these substitutes for liquor are taken usually only after drinking more or less liquor.

Experiments of Nicloux and Placet (Jour. de Phys. et de Path. gén., Sept., 1912) with regard to the toxicity of methyl alcohol in comparison with ethyl alcohol show that while in a single large dose given intravenously methyl alcohol is less toxic than ethyl alcohol, at death there is a greater proportion found in the blood and the tissues; of the tissues, the brain in particular. If the alcohol be ingested and in repeated doses, methyl alcohol is the more toxic, undergoing less complete combustion, and being thus eliminated more slowly.

Vaughan (Jour. of Labor. and Clin. Med., Oct., 1916) has found it inexpensive and safer to take the ordinary alcohol and distil it with quicklime than to use the alcohol imported from Germany.

Therapeutics, i. 525.—J. W. Astley Cooper (Lancet, Nov. 14, 1914) states that his experience of many years has taught him that there are no harmful effects from the *strictly moderate* (his italics) use of alcohol by persons of sound mental and physical health, such as British soldiers supposedly are. He agrees with Mercier and Lyon Smith that asylum statistics tend to show that insanity produces inebriety, and not *vice versa*, as is so frequently averred by the zealous champions of total abstinence.

A. Jacobi (Amer. Med., Sept., 1913) states that no amount of whiskey will lead to intoxication when its effect is needed to combat sepsis, and that his cases of thorough sepsis relieved or cured by alcohol extend over more than half a century. Among these were cases of diphtheria with mixed infection, where his experience had shown that no such infection was amenable to the action of antitoxine.

Antisepsis.—In a bacteriological and histological study of the action of alcohol on hands previously infected with bacterial cultures, Marquis (Revue de Chir., Mar., 1912) found that after 10 minutes' contact of the hands with alcohol, scrapings from the epidermis and material obtained beneath the finger nails yielded no bacterial growth on bouillon in 15 trials; on gelatin the results were negative 25 times, and positive 5 times. Other experiments showed that 10 minutes is the proper time to keep the hands in contact with alcohol for surgical disinfection; that the greater the concentration of alcohol used, the more complete the disinfection; that hands disinfected with alcohol, dried, and kept covered with a sterile compress, remain sterile for at least 15 minutes, while if kept immersed in sterile water they remain sterile for 20 minutes.

Arkhipiants (Russky Vratch, xvi, No. 2, 1917) tested alcohol as a disinfectant and insecticide, and found that, when used instead of solution of formaldehyde and in quantities of 4 or 5 times larger, germs were killed as effectually. He found alcohol of 70 or 80 per cent. strength best adapted for the purpose. The germs used in the tests were cholera vibrios, typhoid and colon bacilli and staphylococci, all on silk threads. They succumbed with alcohol fumes exactly as in parallel tests with solution of formaldehyde.

Pellegrini (Semaine méd., Sept. 24, 1913) found chlorinated alcohol the equal of tincture of iodine in efficiency as a skin disinfectant, and superior to it in other ways. The preparation is made simply by passing chlorine fumes through alcohol, pure or denatured.

Poisoning, vi. 683.—**Treatment of.** —**Ammonium chloride**, according to Hennell (Nouveaux Rém.; Pract., Dec., 1911), is an antidote to alcohol. Given in doses of 30 grains (2 Gm.) to 1 dram (4 Gm.), with copious draughts of water afterward, it prevents the effects of the alcohol, sobers the patient quickly, and is a valuable preventive against delirium tremens.

According to S. Stern (N. Y. Med. Jour., May 16, 1914) alcohol is readily converted into acetic acid, acetone, diacetic acid, lactic and butyric acids, oxybutyric and betabutyric acids in the presence of fermentative and other conditions favorable to chemical conversion, all conditions that are present in alcoholics. Mild alkalies are demanded. By the aid, for example, of **sodium bicarbonate** in large doses widely diluted, undoubted and immediate correction of the disturbances of metabolism described is obtained.

blood-pressure and, ii. 500
chloroform, and ether mixture, iii. 265
Alcohol, methylic, vi. 683
poisoning by, vi. 683

As pointed out by Birsch-Hirschfeld (Jour. Amer. Med. Assoc., from Med. Klinik, Feb. 27, 1916), vision usually becomes impaired in methyl alcohol poisoning before the general symptoms mask the clinical picture. The dilated rigid pupil suggests impending trouble. Optic neuritis is a clue to the diagnosis but has no pathognomonic features. Methyl alcohol poisoning should always be suspected when, along with gastro-intestinal symptoms suggesting poisoning, severe disturbance in vision develops suddenly, with central absolute scotoma and contraction of the peripheral field of vision, and the ophthalmoscope shows optic neuritis. The contraction of the peripheral field of vision usually subsides soon, but the scotoma may persist a long time. Disturbances in vision from *quinine, atoxyl* and *arsacetin* are identified by limitation of the visual field, central vision, persisting good. With *meat and fish poisoning* the eye is affected by paralysis of the muscles.

The prognosis as to vision in methyl alcohol poisoning can be estimated from comparison of the findings in the visual field and fundus, and the visual acuity for a few weeks. Even in the mildest cases, more or less impairment of vision is entailed. Once blindness has appeared, the fate of the eyes is usually sealed by the time the patient reaches the physician.

Eleonskaia (Russky Vratch, xv, No. 11, 1916) reports extreme frequency of poisoning from denatured alcohol in the Petrograd hospitals soon after the prohibition of liquors. From 123 to 332 persons per month were treated in 1 hospital, while in another during the 6 months, 1292 cases were admitted owing to the drinking of denatured alcohol, which contains about 1 per cent. of wood alcohol. Of 1432 subjects treated during 1915, 6 per cent. suffered from amblyopia. One-half of these had used denatured alcohol only, the others, in addition, cologne and furniture polish. The onset of visual disorders occurred 3 or 4 months later, usually after large quantities had been imbibed. The main symptoms were decline in visual acuity, especially of central vision, and disturbances in color sense, especially for red and green, narrowing of the field of vision, change in the fundus (hyperemia of the papilla, blurred outline, pallor of the temporal half of disk, etc.) may also be found, the pupils, however, being usually normal. The visual disorders caused by the use of denatured alcohol are milder than those brought on by pure wood alcohol.

H. H. Tyson (Med. Times, Feb., 1916) points out that whereas 90 per cent. of the ethyl alcohol absorbed is oxidized into carbon dioxide and water in 15 hours, and the remainder oxidized later, only about 40 per cent. of absorbed methyl alcohol is oxidized in 48 hours, forming formic acid, 25 per cent. is eliminated in the urine, perspiration and breath, and the remainder, requiring a longer time for oxidation, circulates in the blood-stream producing a continuous toxic effect. The organism endeavors to eliminate a considerable part of it through the bile, which after entering the intestines is reabsorbed, thus forming a vicious cycle.

Tyson and Schoenberg (Jour. Amer. Med. Assoc., Sept. 12, 1914) state that according to the 1904 United States Census, the following industries and trades were using wood alcohol: Painters, glaziers and varnishers, 278,000 workers; launderers, 386,000 workers; boot and shoemakers, 208,000 workers; barbers, 131,116 workers; printers and lithographers, 155,000 workers; wood-workers—piano, furniture, etc., 112,000 workers; about 500,000 workers divided among dyework operators, brass workers, cabinetmakers, gold and silver workers, harnessmakers, hatmakers, leather workers, tanners, metal workers, photographers, bookbinders, chemists, etc.

Prophylaxis.—The New York City Board of Health made it unlawful to sell any article of food or drink, or any medicinal or toilet preparation intended for human use internally or externally, which contains any methyl alcohol; and, furthermore, no person shall sell any methyl alcohol unless the container in which the same is sold shall bear a notice containing the following device and words conspicuously printed or stencilled thereon, viz: Skull and Crossbones—Poison. Wood Naptha or Wood Alcohol. Warning. It is unlawful to use this fluid in any article of food, beverage or medicinal or toilet preparation for human use, internally or externally.

treatment, vi. 684

affusions, alternate hot and cold in, vi. 684

Tyson and Schoenberg (*loc. cit.*) recommend **calomel, jalap, pilocarpine hypodermically, hot saline baths or packs, saline infusions** and **high saline enemas**; **stimulants**, such as **caffeine** and **theobromine** to produce stimulation with diuresis; **ammonia and oxygen inhalation**, to supply alkalies and aid in oxidation; **alkaline waters** to be given internally.

Alcohol, methylic (*continued*).
  coffee in, vi. 684
  dilution of poison with warm water in, vi. 684
  diuretics in, vi. 684
  heat to body and extremities in, vi. 684
  hot baths in, vi. 684
  milk diet in, vi. 684
  pilocarpine in, vi. 684
  potassium iodide in, vi. 684
  rectal injections, high, in, vi. 684
  stimulants in, vi. 684
  stomach pump in, vi. 684
  strychnine in, vi. 684
 rub, viii. 810
Alcoholic amblyopia, strychnine in, vii. 150
 cirrhosis, liver extract in, i. 797
  with ascites, potassium bitartrate in, vii. 578
 delirium, blood-pressure in, ii. 499
  acute, i. 560

Pathogenesis.—Sceleth and Beifeld (Amer. Jour. Med. Sci., June, 1915) state that after long-continued over-indulgence in alcohol (7 to 10 years) an individual develops delirium tremens. The disease usually manifests itself in three stages—the incipient form, the fully developed classical form, and the comatose form (wet brain). The writers, who see about 2500 cases of alcoholism every year, find that about 10 to 15 per cent. of the cases of delirium tremens pass into the comatose form. The transition from delirium to cerebral edema is fairly well marked. The semi-coma which succeeds the active delirium is striking, and the delirium now becomes the low muttering type. The symptoms of wet brain are essentially meningeal—semi-coma, generalized hyperesthesia, and muscular rigidity (Kernig's sign and neck rigidity) standing out prominently; the more marked are the latter two features the graver is the prognosis. The cerebrospinal fluid is to all appearances normal. The mortality is nearly 75 per cent.

Novoselsky (Roussky Vratch, No. 15, 1915) states that soon after the prohibition of the sale of liquor was enforced, the number of deaths in Petrograd became during the first 4 months considerably smaller, decreasing by 50 per cent. and for some months even lower. During the 3 months preceding his paper, however, it has risen again to the former standard, or even higher, which fact he ascribes to the drinking of denatured alcohol, furniture polish and other substitutes for vodka. Therefore, he says, the effects of prohibition are not decisive.

Pathology, i. 561.—E. F. Hirsch (Jour. Amer. Med. Assoc., Dec. 19, 1914) recalls that in examining the bodies of persons dying from delirium tremens, Le Count found alterations so regularly in the cortex of the adrenals that he was led to seek the reason for the changes. The changes consist in a more or less striking diminution of the yellow color of the normal cortex. In very marked instances a reddish brown color is assumed, with only occasional irregularly distributed areas of yellow, or there may seem to be entire absence of that color. The glands were removed, the fat dissected away and then fixed in a 10 per cent. dilution of liquor formaldehydi, and after a few days the transverse segments were frozen and sectioned. As controls for this work, the adrenals from persons meeting sudden death were used and sections prepared the same way. The adrenals from 34 persons dying from delirium tremens were compared with the controls, and in practically every instance the doubly refractive droplets in the delirium tremens adrenals were diminished slightly, moderately, markedly, very markedly, and sometimes entirely absent in a given area.

ammonia in, i. 611
ammonia (aromatic spirit) in, i. 564
ammonium acetate in, i. 564
amylene hydrate in, i. 623
apomorphine hydrochloride in, viii. 102
arnica in, ii. 118
atropine in, ii. 450

Magnan (Brit. Med. Jour., Aug. 17, 1912) emphasizes the advantages of merely placing excited alcoholic patients, maniacs, and melancholics **in bed, without restraint,** over the use of the strait-jacket, which, by exerting pressure on the thorax as the patient struggles, interferes with respiration, and may even produce death in cases of delirium tremens.

bromides in, i. 564; ii. 643
caffeine in, i. 563
calomel in, i. 565
camphor in, i. 563
camphorated oil in, i. 564
cannabis indica in, iii. 6
capsicum in, iii. 15
champagne in, i. 564
chloral in, iii. 208
chloral-formamide in, i. 563; iii. 215
chloral hydrate in, i. 563
cimicifuga in, iii. 345
cold bath in, i. 564
cold douche in, i. 564
cold-water applications in, i. 563
concentrated broths in, i. 565
digitalis in, i. 563, 564; iv. 158
dormiol in, iv. 336
Epsom salts in, i. 565
ergot in, i. 564; iv. 574
gelsemine in, i. 565
humulus in, vi. 467
hydrotherapy in, i. 562, 563
hypnotics in, i. 564
  Treatment, i. 562

Lumbar puncture is increasingly being tried. E. A. Leonard (Jour. Amer. Med. Assoc., Aug. 12, 1916) in recommending **magnesium sulphate** states that **lumbar puncture** should be performed and 10 to 40 c.c. (2½ to 10 drams) of spinal fluid withdrawn. Then 1 c.c. (16 minims) of a 25 per cent. solution of magnesium sulphate is injected for each 25 pounds of body weight. The withdrawal and injection should be made with the patient in the sitting posture and he should then be lowered to one of semi-recumbency. Constant attention is required for 24 hours after the injection to secure nourishment and proper care of the bladder and rectum. The treatment produces prompt relaxation and often a paraplegic state, which begins to disappear in 12 to 24 hours. S. P. Kramer (Boston Med. and Surg. Jour., Oct. 30, 1913) withdraws cerebrospinal fluid by **lumbar puncture** in amounts as large as possible—50 to 60 c.c. An equal amount of sterile 1 per cent. **sodium bromide** solution is then injected with a syringe. Immediate improvement in delirium usually occurs, followed by temporary return and then permanent disappearance of delirium. Relapse occasionally after a few days is usually controlled by repetition of the injection.

Steinbach (Deut. med. Woch., Mar. 25, 1915) found that the cerebrospinal pressure is absolutely increased in most cases of delirium tremens, and perhaps relatively increased in all. The frequently existing presence of alcohol in the fluid bears no direct relation to the delirium. **Lumbar puncture** shortens the duration of the delirium quite definitely, and renders the course of the malady less severe.

lupulin in, vi. 467
milk in, i. 565
morphine in, i. 563
nutrient enemata in, i. 565
nux vomica in, i. 563
opium in, i. 564
paraldehyde in, vii. 302

Theunissen's (Nederlandsch Tijdsch. v. Geneeskunde, Jan. 9, 1915) mortality for delirium tremens in the last 6 months was 2 per cent. among 120 cases. Kraepelin's mortality was 3 or 4 per cent., Bonhoeffer and Ziehen's 9 or 10 per cent., while Ganser has had only 1 per cent. The writer ascribes his better results to the method of treatment, which consists essentially in the **closest watching** over the patient, looking out for a relapse or a tendency to suicide. The patient is not kept alone in a separate room unless absolutely necessary. The **diet is abundant** but preferably **milk** alone. Sedatives, **paraldehyde** or **amylene hydrate,** either internally or by the rectum, are given as required, and **stimulants** are given at the end when there is anything in the previous history to suggest danger on the part of the heart.

potassium bromide in, i. 563
proctoclysis in, viii. 196
quinine in, iii. 388
saline solution in, i. 565
scopolamine hydrobromide in, viii. 102
sleep in, i. 563
sodium acetate in, i. 565
sodium bicarbonate in, i. 563

Kramer (Ohio State Med. Jour., Mar., 1914) has used 1 per cent. solution of **sodium bromide** injected **into** the **spinal canal** in a series of 20 cases. As high as 80 c.c. ($2\frac{2}{3}$ ounces) of fluid has been injected into the subdural cavity in an interval of 1 minute without the least sign of increased intracranial pressure. The patients as a rule show an immediate improvement, a lessened delirium within a few minutes.

J. J. Hogan (Jour. Amer. Med. Assoc., Dec. 16, 1916) states that in the severe types of acute alcoholic delirium that have come under observation, 64 cases have all given evidence of a severe acid intoxication. The symptoms represent the effects of the alcohol on the nervous system and liver, and the pathologic changes may range from simple edema to severe degenerative changes of the fatty type. Any treatment, to be of service, therefore is indicated in the stage of edema. After experimental work with various salts that have the power of dehydrating edematous tissues, he devised a mixture of **sodium bromide, sodium chloride** and **sodium bicarbonate** that could be used in large quantities intravenously without producing the toxic effect of bromide as ordinarily given in large doses. As the severe types also suffered from starvation acidosis, **glucose** in high concentration was also used intravenously; this not only furnished an available carbohydrate that was readily utilized by the body, but in 30 per cent. concentration produced marked dehydrating effects on the central nervous system.

In the preparation of the solutions 5.8 Gm. ($1\frac{3}{10}$ drams) of chemically pure sodium chloride and 8.4 Gm. ($2\frac{1}{10}$ drams) of chemically pure sodium bicarbonate were boiled in 120 c.c. (4 ounces) of distilled water and filtered through paper, then placed in a flask and reboiled. In addition 10.2 Gm. ($2\frac{1}{2}$ drams) of chemically pure sodium bromide were boiled in 30 c.c. (1 ounce) distilled water, filtered and reboiled. These may be kept ready for use, and when needed are added to 850 c.c. ($28\frac{1}{3}$ ounces) of either freshly distilled water or tap water that has been filtered and boiled. Under no circumstances should old distilled water be used, as it has been found that it produced severe chills. This mixture is heated to about 110° F. (43.3° C.) and is ready for use. Both of these solutions must be given very slowly, from 20 to 30 minutes being taken for the 1250 c.c. ($2\frac{1}{2}$ pints) or 1000 c.c. (2 pints) employed. A small percolator, such as is used in giving salvarsan, with rubber tubing and needle attached, is all the apparatus that is needed.

The mortality was lower, 9.3 per cent.; the time of detention less, an average of 2.63 days, and the period of delirium much shortened. The patients ate better. The desire for alcohol was abolished, at least for the time being.

sparteine in, i. 565
strophanthus in, i. 563
strychnine in, i. 563; vii. 148; viii. 102
sumbul in, viii. 433
trional in, i. 564
veronal in, i. 563, 564

E. Von der Porten (Deut. med. Woch., xli, 34, 1915) extols **veronal** after treating 382 cases with a mortality of but 5.49 per cent. It was given on admission, the patient receiving 1 Gm. (15 grains) in warm tea, and in 3 hours later a second similar dose. If this did not suffice to quiet the patient, another gram was given 5 hours after the first dose, and in very resistant cases a further dose within the first 12 hours.

To avoid **hot packs** and **hot baths** is an important feature recently emphasized. The temperature balance in delirium tremens, according to Schnitzler (Nederlandsch Tijdschrift voor Geneeskunde, July 31, 1915), is readily upset, and a fatal rise may result by some of the therapeutic measures used. In his cases the patients had been so agitated that warm packs were given. The pack in one case was ordered at a temperature of 28° C. (82.4° F.). In 15 minutes the man was unconscious and his temperature had run up to 43° C. (109.4° F.), pulse 186, respiration 60. He was rapidly unpacked and given stimulants, with ice to the head. The temperature dropped to 42.2° C. (108° F.), the pulse to 160, and respiration to 42, but Cheyne-Stokes respiration developed and the man died in less than two hours after having been given the warm pack. The 2 other patients also died within a few hours after a tepid pack, but the temperature was not taken in these latter hours. There seems every reason to assume that the interference with the normal radiation of heat by the wet pack was responsible for the upset in the temperature balance. The prolonged hot bath, according to Scharnke (Münch. med. Woch., May 19, 1914), causes the cardiac strain which may lead to collapse when the heart is already weakened. When the patients are unruly, he does not allow them to be restrained by bodily force, but places them in an **isolation room.** As a prophylactic measure against cardiac collapse, he gives **digitalis** in large doses, usually **digalen,** of which he gives 30 drops three times daily. To overcome the muscular unrest, **veronal** in doses of 15 to 30 grains (1 to 2 Gm.) is given.

[An important feature which must not be overlooked is that hemolysis and, in some, autolysis, entailing death, may be caused by heat, the alcohol enhancing actively oxidations and thereby the proteolytic activity of cellular ferments.—C. E. de M. S.].

Alcoholic delirium (*continued*).
- **wet pack** in, i. 564
- **whisky** in, i. 564
- blood-pressure in, ii. 499

- gastritis, see Gastritis, Alcoholic, this Index.
- indulgence, excessive, **ammonia** in, i. 611
- intoxication, see Alcoholism, Acute, i. 541, also this index.
- mania, acute, i. 565
  - **apomorphine** in, i. 566
  - **bromides** in, i. 566
  - **capsicum** in, iii. 15
  - **cold affusions** in, i. 566
  - **ipecacuanha** in, i. 566
  - **milk** in, i. 566
  - **morphine** in, i. 566
  - **potassium bromide** in, i. 566
  - **potassium iodide** in, vi. 23
  - **saline draughts** in, i. 566
  - **wet packs** in, i. 566
- neuritis, vi. 797
  - **methylene blue** in, vi. 686
- paralysis due to, **strychnine** in, vii. 149
- pneumonia, see Pneumonia, Alcoholic, vii. 534, 565
- poisoning, **strychnine** in, vii. 145
- tremor, **scopolamine** in, viii. 103
  - **strychnine** in, vii. 147

Alcoholics, indigestion of, **ammonium carbonate** in, i. 617

Alcoholism, i. 538

> Widmark (Hygiea, Feb. 28, 1917) using a modification of Nicloux's test for alcohol in the blood studied the alcohol content of the urine in 37 intoxicated persons. He concluded that the presence of the alcohol in the urine is the result of a diffusion process, and does not depend on the secretory capacity of the kidneys. The proportion of alcohol in the urine can never, he holds, be higher than that in the blood; if the alcohol content of the urine is 4: 1000, for example, we can conclude that the concentration of the alcohol in the blood must at least have reached this figure.

- acute, i. 541
  - **ammonium carbonate** in, i. 545
  - **ammonium chloride** in, i. 620
  - **apomorphine hydrochloride** in, i. 546; ii. 66; vii. 148
  - **atropine** in, i. 546, 554

Alcoholism, acute (*continued*).
  caffeine in, iii. 524, 525
  chloralose in, iii. 216
  digitalin in, i. 546
  digitalis in, i. 546; iv. 157
  elaterium in, iv. 415
  external heat in, i. 546
  gelsemium in, v. 18
  hypodermoclysis in, i. 546
  phosphorus in, vii. 455
  pilocarpine in, vii. 472
  saline solution in, i. 546
  strychnine in, i. 546; vii. 136, 148
  veronal in, viii. 807
 chronic, i. 547

Diagnosis, i. 550.—In chronic alcoholics with normal heart and kidneys, after abstinence had been enforced in the hospital, Raff (Deut. Archiv f. klin. Med., cxii, Nu. 3-4, 1913) noted a marked rise in the systolic pressure for a few days, with a gradual fall. The diastolic pressure was constantly high throughout the whole period, so that the increased pulse pressure was caused only by the rise in the diastolic pressure. This peculiar blood-pressure curve is so constant that it might prove useful in doubtful cases for diagnostic purposes.

E. Martini (Deut. med. Woch., Dec. 10, 1914) tested the serums of 9 alcoholics by Abderhalden's method against liver tissue, and distinctly positive reactions were obtained in 7 of the cases. The other 2 reacted negatively. It seems probable that the Abderhalden test will be found of diagnostic value in cases of alcoholism even before there is any evidence from symptoms or physical signs that the liver has been affected.

Pathology, i. 552.—The evil influence of alcohol on the offspring has been emphasized by several observers. C. Ortali (Gaz. degli Osped., xxxiv, Nos. 143-146, 1913) reiterates that a child procreated while one or both of the parents is drunk—even although the parents otherwise are only moderate drinkers—is usually below par in some way, mentally or physically. Even 1 per cent. of ethyl alcohol in the water will check the development of the embryo; 2 per cent. will cause development of deformities, and the growth is much retarded, while with 4 per cent. there is no growth at all. Alcohol taken as a beverage passes into the ovaries, testicles, and prostate and into their secretions. Out of 200 weaklings and backward children studied, Schlesinger (Münch. med. Woch., lix, 649, 1912) found 30 per cent. who were the children of drunkards. A percentage of 40 to 60 was found in severe intellectual weakness, in imbecility, and idiocy. The low vitality found in drunkards' children is traced back to the female parent. Sullivan and Arrivé state that 55 per cent. of the children of alcoholic mothers die either at birth or within 2 years.

These unfortunate children show nutritional disturbances, catarrh of the respiratory tract, and especially lowered immunity to infections from their first year of life. A series of 298 cases of mental deficiency observed in 117 families by Gordon (Monthly Cyclo. and Med. Bull., Jan., 1912) in which the influence of alcohol on the mental state was studied, showed that there were 200 individuals in the first generation of offspring more or less affected mentally. Imbecility, feeble-mindedness and epilepsy were frequently noted. Obsessions, phobias, irresistible impulses, criminal tendencies, etc., were also common. Many of the offspring had shown a marked desire for alcohol at an early age. The deficient individuals of the second generation presented the same multiplicity of manifestations as those of the first, but with greater intensity. The third generation offspring also illustrated the progressive mental deterioration occurring as result of hereditary transmission of the alcoholic tendency.

Blood-pressure estimates were made by C. Lian (Bull. de l'Acad. de Méd., Nov. 9, 1915) in a series of 150 soldiers, all aged 42 to 43 years. Among the 16 sober subjects, only 6.25 per cent. showed high blood-pressure; of

53 moderate drinkers, 7.54 per cent. showed high pressure; of 57 heavy drinkers, 17.54 per cent., and of 24 very heavy drinkers, 25 per cent. The conclusion is reached, therefore, that alcoholism is an important factor in the etiology of arterial hypertension.

In a study of chronic alcoholism Vogelius and Wiltrup (Hospitalstidende, Mar. 15, 1916) found that gastritis and achylia are the rule, but a number of factors combine to induce them, not only the liquor but the irregular meals and habits of life of persons addicted to alcohol. Achylia was pronounced in 50 per cent. When they enter the hospital and get regular food and rest, the stomach usually rapidly recuperates and, as the gastritis subsides, the achylia subsides with it. Determination of the pepsin may be important for the prognosis, as the achylia did not retrogress in the few with apepsia. The discovery of inadequate pepsin secretion therefore prophesies permanent achylia.

Prognosis, i. 552.—The use of tobacco changes the prognosis greatly, in the opinion of Lambert (Boston Med. and Surg. Jour., Apr. 25, 1912), who has arrived at these conclusions against his previous prejudices. Among those alcoholics who have otherwise a good prognosis, the chances are even that he will return to alcoholism if he is a cigarette smoker. If he smokes a pipe or cigar the chances are about 3 to 2 that he will not return. If he does not smoke at all the chances are about 8 to 2 that he will not return.

According to W. E. Porter (Med. Rec., Oct. 20, 1915) the largest insurance companies in America and in England show statistically that the average mortality rate among total abstainers from alcohol is 68.4 per cent. of the expected rate, whereas that of the non-abstainer is 91.5 per cent., a difference of 23.1 per cent. This means a reduction of two and a third years in the average life of a non-abstainer.

Alcoholism, chronic (*continued*).
- **aloin** in, i. 559
- **ammonium chloride** in, i. 559
- **apomorphine** in, i. 554, 556, 557; vii. 148
- **arsenic** in, i. 558
- **atropine** in, i. 556, 558, 559
- **baths** in, i. 554
- **belladonna** in, i. 556, 557
- **caffeine** in, i. 558
- **calomel** in, i. 556
- **cannabis indica** in, i. 557
- **capsicum** in, iii. 15
- **cathartics** in, i. 554
- **cereals** in, i. 558
- **chromium sulphate** in, iii. 338
- **cimicifuga** in, iii. 345
- **cinchona** in, i. 557, 559
- **coffee** in, i. 558
- **cold fomentations** in, i. 557
- **diuretics** in, i. 555
- **ergot** in, i. 559
- **exercise** in, i. 555, 558
- **gold** in, v. 74
- **gold chloride** in, i. 559
- **home treatment** in, i. 553
- **hospital treatment** in, i. 555
- **hot bath** in, i. 556
- **hot fomentations** in, i. 557
- **hot packs** in, i. 558
- **humulus** in, i. 554
- **hydropathic measures** in, i. 553
- **hyoscine** in, i. 559
- **hyoscyamine** in, i. 554
- **hyoscyamus** in, i. 556, 557

Zausailoff (Roussky Vratch, Aug. 4, 1912) has employed **hypnotic suggestion** in 1284 cases of alcoholism, principally chronic. Favorable results were obtained in 80 per cent. In view of the ease of application and freedom from any bad effects, the author urges the general employment of this method.

- **ichthyol** in, v. 640
- **ipecac** in, i. 558
- **kola** in, vi. 236
- **lupulin** in, i. 557
- **malted milk** in, i. 558
- **mercury** in, i. 558
- **methylene blue** in, vi. 686
- **paraldehyde** in, vii. 302
- **phosphorus** in, vii. 455
- **prolonged rest** in, i. 558
- **psychotherapeutics** in, i. 555

Alcoholism, chronic (*continued*).
  quassia in, i. 554, 557, 558
  quinine in, i. 558
  salines in, i. 554, 557
  salt bath in, i. 557
  sodium bromide in, i. 554, 557
  sodium chloride in, i. 559
  strychnine in, i. 554, 556, 557, 558, 559; vii. 147
  tea in, i. 558
  Turkish baths in, i. 558; viii. 812
  valerian in, i. 557
  viburnum in, i. 559
  xanthoxylum in, i. 556, 557
Aleppo boil, see Oriental Sore, vii. 213
Alexia, ii. 49

Casamajor and Karpas (Jour. Nerv. and Mental Dis., Sept., 1912) record a case of almost pure alexia associated with right homonymous hemianopsia, occurring suddenly in a woman of advanced years. Use of **Liepmann's chart,** and **operation** tended to confirm the view that the location of the lesion was deep in the white matter of the left occipital lobe where it involves the optic radiations, and also the commissural fibers from the right visual cortex to the left angular gyrus.

Alibert's disease, see Mycosis Fungoides, vi. 775, also this Index.
Alimentary anaphylaxis, acute, viii. 197
  canal, angiomata of, ii. 525
Alkali poisoning, see Milk Sickness, vi. 707
Alkaline bath, viii. 813
  waters, vi. 710
    aperient, vi. 711
    saline, vi. 710
Allingham's gag, v. 800
Allotriophagia, viii. 340
Allspice, see Pimenta, vii. 472
Almén-Schönbein (guaiac) test for blood, v. 395
Aloes, i. 566
Alopecia, i. 570

Etiology, i. 573.—Petersen (Dermat. Zeitsch., Apr., 1915) reports an example of hereditary alopecia due to hypothyroidia, occurring in 3 generations, affecting equally the male and female members of the family, and limited strictly to the scalp. The affected individuals were born with a normal growth of hair which continued to grow normally until about the fourth or sixth year. It then began to fall out and lose its pigment, becoming completely colorless, and continued to do so until at puberty or a little later the scalp was completely bald. In 3 children of the family under observation the administration of **thyreoidin,** in doses of ½ to 1½ grains (0.03 to 0.09 Gm.) daily, was followed by good results.

Montgomery (Jour. Cutan. Dis., Apr., 1915) holds that a diminution or absence of the secretion of the thyroid gland is known to cause the following changes in the skin: Myxedema, roughness and dryness of the skin; yellow complexion with a rather circumscribed redness of the cheeks, called the "malar flush"; dry seborrheic coating of the scalp, constituting at times a thick crust; dryness, lack of luster and wiriness and defluvium of the hair. He cites a personal case in which progressive alopecia yielded rapidly under a careful **diet** and 5 grains (0.3 Gm.) of **thyroid gland** a day.

In reporting a case of congenital alopecia, Blaisdell, Cunningham and White (Boston Med .and Surg. Jour., Feb. 8, 1917) remark that its really important and striking features, based on a careful study of serial sections from different parts of the skin, were the following: there were comparatively few vessels; there was 1 arrector pili muscle; 1 abortive follicle; no hair shaft; no sebaceous glands; and no sweat glands.

acetic acid in, i. 230, 575
ammonia in, i. 612
arsenic in, i. 575
bay rum in, i. 575
benzoin in, i. 576
betanaphthol in, i. 575
cantharides in, i. 575; iii. 14
capsicum in, i. 575
captol in, i. 577
castor oil in, i. 575
chloral hydrate in, i. 577
cocoanut oil in, i. 576
codliver oil in, i. 575

Alopecia (*continued*).
  daily shampooing in, i. 576
  euresol in, i. 577
  exposure of scalp to sunlight in, i. 575
  frequent ablution of the head in, i. 576
  gallic acid in, iv. 793
  glycerin in, i. 575
  high-frequency spark in, i. 576
  iron in, i. 575
  lactic acid in, vi. 243
  massage in, i. 575

In premature baldness, according to G. T. Jackson and McMurtry (Med. Fortnightly, May 25, 1914), **massage of the scalp** should be frequently and thoroughly done, for 20 or 30 minutes at a time. The masseur should use an emollient cream, such as the following:—

℞ *Ceræ albæ* ...	ʒvj (24 Gm.).
Petrolei	℥v (150 Gm.).
Aquæ rosæ ..	℥iiss (75 Gm.).
Sodii boratis,	gr. xxxvj (2.4 Gm.).
Sulphuris præcipitati	ʒvij (28 Gm.).

M. et ft. cremor.

Deep brushing with a long bristle brush for a few minutes night and morning is also advised, and **electricity** and **vibratory massage** have their advocates.

Pilocarpine is the only medicinal agent that appears to exert a specific action.

℞ *Pilocarpinæ hydrochloridi*	gr. xx (1.3 Gm.).
Aquæ coloniensis	℥iv (120 Gm.).
Aquæ rosæ, *Alcoholis absoluti* .....āā	℥ij (60 Gm.).

M. Sig.: To be well rubbed in night and morning.

  mercury bichloride in, i. 575, 576, 577
  naphthol in, i. 576
  outdoor life in, i. 575
  petroleum in, vii. 413
  phosphorus in, i. 575
  pilocarpine nitrate in, vii. 471
  quinine in, iii. 392
  resorcin in, i. 575, 576
  restricted use of meats in, i. 575

Alopecia (*continued*).
  salicylic acid in, i. 576
  static electricity in, i. 576
  strychnine in, i. 575
  sulphur in, i. 575
  sulphur soap in, i. 576
  tar liniment in, i. 576
  tar soap in, i. 576

J. D. Harris (Lancet, July 6, 1912) gives half-hour exposures of the bald areas to the **ultraviolet rays**, protecting the area with small blocks of ice. He has treated 9 patients with excellent results in all but 2.

  thymol in, i. 576
  tincture of green soap in, i. 575
  vaselin in, i. 576
  wire brush in, i. 576
areata, i. 577

Etiology, i. 578.—R. Sabouraud (Annales de dermat. et de syphil., Feb., 1913) concludes that there exists a more or less intimate and obvious relationship between genital disturbances and this disorder. In the female sex there is a form of alopecia that follows the menopause and even a prolonged suppression of the menses. Such alopecia may be either mild or severe. This disease may also follow oöphorectomy, and here again the prognosis is variable. In less frequent instances alopecia appears, usually in a mild form, in the course of several consecutive pregnancies.

J. E. Lane (Boston Med. and Surg. Jour., Jan. 11, 1917) observed an instance in an Italian boy, 5 years old, of ringworm of the scalp and alopecia areata appearing simultaneously in the same location. He deemed it of some interest on account of its possible bearing on the cause of some of the epidemics of alopecia areata occasionally reported.

  absolute alcohol in, i. 581
  actinic light rays in, i. 582
  alcohol in, i. 580, 581
  ammonia in, i. 580
  arsenic in, i. 580; ii. 142
  atoxyl in, ii. 262
  bacterial vaccines in, ii. 406
  benzin in, vii. 413

Alopecia areata (*continued*).
  betanaphthol in, i. 580, 581
  Bier's hyperemia in, v. 599
  cantharides in, i. 580; iii. 14
  capsicum in, i. 580
  carbolic acid in, i. 580, 581
  castor oil in, i. 580
  chrysarobin in, i. 580
  chrysarobin ointment in, i. 581
  codliver oil in, i. 580
  essential oils in, i. 580
  faradic current in, i. 582
  formaldehyde in, i. 581

Sutton (Journal Mo. State Med. Assoc., Jan., 1916) holds that the disorder is essentially due to ganglionic injury, following trauma or infection. During the past 4 years he has given **hexamethylenamine** in all his alopecia areata cases. The dosage varies, but the majority of patients can comfortably take from 5 to 10 grains (0.3 to 0.6 Gm.) in plentiful amounts of water, after each meal, for considerable periods of time. If there is any resulting vesical irritation the remedy should be withdrawn for a few days and then its use gradually resumed. His results have been far more satisfactory since its adoption than before. Locally, stimulating applications are the most valuable.

  high-frequency currents in, i. 582
  iodine in, i. 580
  iron in, i. 580
  mercury in, i. 580, 581
  naphthol in, i. 581
  phosphorus in, i. 580
  Piffard's iron spark-gap lamp in, i. 582
  quinine in, i. 580
  salicylic acid in, i. 581
  strychnine in, i. 580
  sublimate solution in, i. 581
  sulphur in, i. 580
  tar soap in, i. 581
  trikresol in, i. 580, 581
  turpentine in, i. 580
  ultraviolet rays in, i. 582

R. Horand (Lyon méd., Aug. 18, 1912) reports a severe case of alopecia areata, rebellious alike to applications of mercury bichloride, pilocarpine, croton oil, etc., as well as to the use of a constricting band and to internal medication, in which exposures of the affected areas to the **ultraviolet rays**, by means of Kromeyer's lamp, gave good results. These rays induce pronounced and prolonged cutaneous hyperemia. They are both more active and safer than the X-rays. A. Fischkin (Ills. Med. Jour., May, 1916) also states that **ultraviolet rays** have given excellent results in his hands in cases of alopecia areata and other dermatoses.

  vaccines in, i. 406
  vaselin in, i. 581
 circumscripta, i. 577
  chrysarobin in, iii. 339
  tannic acid in, viii. 498
  thymol in, viii. 533
 congenital, i. 571
 premature, i. 572
 seborrhœica, i. 573
 senile, i. 572
 syphilitic, viii. 460
Alphanaphthol, vi. 786
Alsol, i. 588
Altitude sickness, vii. 733
Alum, i. 582

The influence of alum in baking powders was studied by a Referee Board of Consulting Scientific Experts composed of R. H. Chittenden, A. E. Taylor, and J. H. Long, appointed by the U. S. Department of Agriculture (Bulletin No. 103, Apr. 29, 1914). The general conclusion reached was that alum baking powders are no more harmful than any other baking powders, but that it is wise to be moderate in the use of foods that are leavened with baking powder.

Aluminum, i. 586

Physiological action, i. 586.—Roth and Voegtlin (Jour. Pharm. and Exper. Therap., Feb., 1916) state that when aluminum, in the form of aluminum lactate or sodium aluminum lactate, is fed to rabbits, cats, or dogs for long periods of time, certain distinct effects such as diarrhea, with, at autopsy, corrosion of the stomach, together with congestion, and a hemorrhagic condition of the intestinal mucosa result. Large doses caused numerous areas of intestinal hemorrhages and a few areas of ulceration, which were especially marked in the large intestine.

Untoward effects, i. 586.—When aluminum vessels were first used for cooking some doubt existed as to their safety. Increasing experience has shown that such objections do not exist, John Glaister (Editorial Therap. Gaz., Sept., 1913) having found that the largest amount of aluminum was detached when marmalade was made with oranges and lemons, but the amount recovered was so small that it would have been perfectly harmless even if the entire 2½ ounces of preserves had been eaten at one meal by a single individual.

Esau (Med. Klinik, July 14, 1912) reports 3 cases in which dressings with solution of aluminum acetate produced necrosis of the injured hand. The effect of the dressing was similar to the burns caused by phenic acid.

Therapeutics, i. 587.—Solution of aluminum acetate, according to Stansbury (Amer. Jour. of Surg., Feb., 1912), is more efficacious than the commoner applications, iodine, ichthyol, lead and opium, etc., in the treatment of local congestions, such as **boils, carbuncles,** and especially in facial **erysipelas.** He has used it also with marked success in severe **cellulitis** and **inflammatory rheumatism,** and declares it the best remedy for **ivy poisoning.** Several thicknesses of gauze are soaked with the solution and applied to the part, covered with rubber tissue or oiled silk, and a bandage applied. It need be renewed only once or twice in 24 hours. Liquor alumini acetatis of the National Dispensatory is the best solution, and is made up as follows: Aluminum sulphate (N. S. P.), acetic acid (N. S. P.), of each, 300 Gm. (10 ounces); calcium carbonate (C. P.), 130 Gm. (4⅓ ounces); distilled water, 1000 c.c. (1 quart).

Alumnol, i. 590

Alveolar abscess, vi. 729
  cocaine in, vi. 729
  hot water in, vi. 729
  lancing in, vi. 729
  leeching in, vi. 729
  pyorrhea, see Riggs's Disease, viii. 30; also this Index.

Alypin.

This is a white crystalline neutral powder, very soluble in water, which is not precipitated by alkaline fluids. Its properties are not impaired by boiling for 10 minutes. It was introduced as an anesthetic to replace cocaine. A 1 per cent. solution produced deep anesthesia of the rabbit's cornea in 50 or 60 seconds. The lethal dose in dogs and cats is about double that of cocaine. It is relatively non-toxic and is a pure local anesthetic. It has been used in a 2 per cent. watery solution. When dropped into the conjunctival sac there is a slight smarting. In about 70 seconds the conjunctiva together with the cornea is insensitive to touch. A few seconds later the ocular conjunctiva may be seized with fixation forceps without the patient experiencing pain. There is usually some dilatation of the superficial vessels, but no dilatation of the pupil. There is no interference with accommodation; it does not affect the corneal epithelium.

Alypin has been lauded by several observers, according to Wolff Freudenthal (Med. Record, July 20, 1912), but others assert that the anesthesia produced is very weak. It may be used for removal of enlarged turbinated bodies, since it does not cause, as does cocaine, a very marked contraction of the hypertrophied turbinal.

Untoward Effects.—A. H. Miller (Jour. Amer. Med. Assoc., Jan. 17, 1914) reported 103 cases in which alypin had been used as a local analgesic. Of these 35 were minor surgical operations and 69 genito-urinary. In 100 of the cases analgesia was perfectly satisfactory, in 2 the analgesic caused serious difficulty and in one instance death. In the last case the patient was an apparently healthy adult, 39 years of age, who was about to undergo dilatation for stricture of the urethra. About 2 drams (8 Gm.) of a 10 per cent. solution were introduced into the urethra and bladder. Two minutes later the patient had a general convulsion, followed by a half-dozen during the next 10 minutes, with cessation of respiration and arrest of the pulse. Artificial respiration and stimulation were tried without avail. In a very similar case the patient was revived after about 2 hours' work. In a third untoward case about 1½ drams (6 Gm.) of a 10 per cent. solution was introduced into the urethra and bladder for dilatation of a stricture. In 3 minutes the patient became unconscious, and respiration became embarrassed, but the pulse remained good. **Artificial respiration** and inhalations of **oxygen** brought this patient around in about 10 minutes. The author considers Bremmermann's technic of depositing a tablet of alypin at the point of analgesic localization as far preferable to injecting an unmeasured quantity of the 10 per cent. solution into the urethra.

Alzheimer's disease.

Two cases of this rarely encountered mental disorder, both in men of 49, were reported by C. I. Lambert (Psychiatric Bull., Oct., 1916), both with a history of alcoholism. A most profound dementia developed slowly and insidiously in both. Inattention, indifference and absentmindedness, declining efficiency, progressive impairment of memory, of retention, grasp and poverty of thought, followed by aimless, restless, foolish behavior and increasing mental dilapidation which went on apace toward an apathetic dementia, incapacity to comprehend, to talk, to walk; this was followed by a bedfast state in which the patient muttered and mumbled and fussed and fumbled, and pulled at his bedding, wet and soiled himself, chewed a little and gulped what was put in his mouth and vegetated for a time and died like a decerebrated animal. Among the more striking symptoms in these cases were the outstanding symptoms of agnosia, aphasia and apraxia.

Amastia, vi. 539

Amaurosis, i. 592

Etiology, i. 592.—N. B. Harman (Brit. Med. Jour., Aug. 29, 1914) classified the causes of blindness in a series of 1100 children into 3 groups: Injury or destruction of the cornea through surface inflammation within the eyeball or optic nerve; congenital defects of the eyes. Surface inflammation involved the eyes of 351 children, and of this number no less than 266 had ophthalmia neonatorum, giving a proportion for this disease of 24 per cent. of the total cases of blindness. Only 47 cases were due to purulent conjunctivitis of later years, and 38 to phlyctenular keratitis. Syphilis was the cause of 190 cases of interstitial keratitis, of 126 cases of disseminated choroiditis or other blinding lesion of the posterior half of the eyeball, and of 16 cases of congenital blindness. Syphilis, therefore, accounted for a total of 343 cases of blindness, or 31.7 per cent. of the whole 1100 cases, or of considerably more than were due to gonorrheal infection. This is in part the result of the recent more or less general use of some prophylactic agent in the eyes of the newborn to prevent gonococcic infection. Since 1904 the figures show that there has been a definite reduction in the proportion of cases of blindness due to the gonococcus, while the proportion due to syphilis has risen. This rise is attributable mainly to two factors: the reduction in cases due to ophthalmia neonatorum, and a greater accuracy in the diagnosis of syphilis; and there is no evidence in the statistics to warrant the conclusion that hereditary syphilis is increasing. The grand result of this examination of causes of blindness, says Harman, is that more than one half of the children owe their miserable state to venereal disease in their parents.

In a study of the causes of blindness, H. L. Gowens (Hahn. Mthly, Apr., 1914) shows that 88.58 per cent. of all blindness is preventable as against 11.42 per cent. incurable and non-preventable blindness. Even after eliminating purulent ophthalmia and high myopia there still remains 85 per cent. as a percentage of blindness which is conceded to be preventable blindness as against 15 as a percentage which is non-preventable and incurable. L. Newmark (Jour. of Ophthal. and Otolaryn., May, 1914) describes 3 patients who were blind for longer or shorter periods after blows on the back of the head that did not fracture the skull. He ascribes the blindness to a traumatic affection of the occipital lobes, shock or hemorrhage, or both.

Pathology, i. 592.—H. H. Stark (Jour. Amer. Med. Assoc., Oct. 30, 1915), in reporting cases of eye complications of sinus disease, reviews the literature. Of 88 cases reported, the optic nerve was involved in 52. Variations in the pupil occurred as one of the earliest symptoms. Exophthalmos occurred in 11, and involvement of the extrinsic muscles in 11. Central scotoma was the most definite, and the one on which the author most relies.

Amaurotic family idiocy, vii. 201
Ambard's constant, see Kidney Tests, this Index.
Amblyopia, i. 596

Etiology, i. 596.—A curious case of quinine amblyopia is reported by Welton (Annals of Ophthal., Oct., 1912), in which a moderate impairment of vision came on suddenly after taking considerable quinine, and restoration of central vision took place within a week, although the visual fields for both form and colors remained permanently contracted. The retinal vessels remained small, and the optic discs were extremely pale, with the picture of atrophy.

On the basis of 25 cases studied by Keutel (Klin. Monatsbl. f. Augenh., Feb.-Mar., 1915), he concludes that sympathetic ophthalmia does not exist and that the expression should be stricken from ophthalmic terminology. Those cases where, following enucleation, the visual acuity rapidly improves, are explicable in the majority of cases by the circumstance that the irritative symptoms—photophobia and lacrimation—disappear, symptoms which influence the visual acuity mechanically or functionally; or else suggestion plays its important part in bringing about a rapid improvement of the visual acuity with the accompanying contraction of the fields.

alcoholic, i. 596
pilocarpine in, vii. 472
strychnine in, vii. 150
arsenic, **strychnine** in, vii. 150
exanopsia, i. 599
from exhaustion, i. 600
from intracranial causes, i. 597
hysterical, i. 598
lead, i. 596
strychnine in, vii. 150
simulated, i. 598
tobacco, i. 596

H. de Waele (Bull. de l'Acad. Roy. de Méd. de Belgique, Jan. 28, 1911) obtained excellent results in tobacco amblyopia from **lecithine** 0.1 Gm. (1½ grains) used subcutaneously once a day. It exceeded all other treatments in efficiency.

pilocarpine in, vii. 472
strychnine in, vii. 150
toxic, i. 596
mercury in, vi. 673
Amebic dysentery, see Dysentery, Amebic, iv. 366, also this index.
Amebic hepatitis, **emetine** in, iv. 448, 451
liver abscess, **emetine** in, iv. 451
Amenorrhea, i. 600

Etiology.—But little of value has been suggested in this connection. Emil Novak (N. Y. Med. Jour., June 17, 1916) holds that many cases of amenorrhea are traceable directly to absence of corpus luteum owing to the degeneration of unruptured follicles. This probably accounts for the good results obtained in some cases from corpus luteum organotherapy.

Wiener (Amer. Jour. of Obstet., Oct., 1913) refers to the case of a woman of 25 who had not menstruated for 5 years. Bilateral dermoids were found. A review of the literature showed that little attention had been paid to the possibility of amenorrhea being due to ovarian tumors. According to one investigator, amenorrhea does occur in about 2 to 3 per cent. of ovarian growths.

Ottow (St. Petersburg med. Zeit., Sept. 28, 1912) reported a case in a woman of 34, a v-para, whose menstruation had always been suspended during the period from May to September. He found this same anomaly in the case of another healthy woman of 44; menstruation, normal at all other times, had always been suspended between spring and fall. The women during the winter lived a quiet, indoor existence, but with the spring they went into the fields and worked at farm labor until after the harvest.

aconite in, i. 285
active exercise in, i. 605
aloes in, i. 570
ammonium acetate in, i. 615
amylene hydrate in, i. 623
apiol in, i. 606; ii. 59
aspirin in, ii. 221
baths, warm full in, viii. 812
Bier's hyperemia in, v. 597
cantharides in, iii. 13
cimicifuga in, iii. 345
colchicum root in, i. 606
corpus luteum in, i. 790

Fresh **corpus luteum** of sow in 20-grain (1.3 Gm.) capsules—3 or more daily—gave good results in functional amenorrhea, both in young girls and adult women treated by Burnam (Jour. Amer. Med. Assoc., Aug. 31, 1912).

cupping of cervix in, i. 605
diet in, i. 605
dilatation of the uterus in, i. 606

Loop (N. Y. State Med. Jour., Apr., 1917) recommends for cases of amenorrhea due to infantile uterus hygienic and tonic measures; the **uterus slowly dilated** with graduated dilators; **iodine** or 95 per cent. **phenol** applied to the endometrium; and later the insertion of a **stem pessary** and the careful administration of **thyroid extract** or **corpus luteum**, given continuously over a considerable period of time.

electricity in, i. 606
exercise in, i. 606
faradic current in, i. 605
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gold in, v. 74
guaiac in, v. 143
guaiac (ammoniated tincture) in, i. 606
kaolin in, i. 605
light exercise in, i. 605
manganese in, i. 605
manganese dioxide in, i. 605
Marienbad cure in, i. 605
nourishing food in, i. 606
nux vomica in, vii. 151
out-of-door life in, i. 605
ovarian gland in, i. 606, 788

In amenorrhea, relative or absolute, **ovarian gland** is considered the best remedy by Bandler (Arch. of Diag., Jan., 1913).

oxalic acid in, i. 605
petroleum cerate in, i. 605

R. Hofstatter (Zentralbl. f. Gynak., Nu. 46, 1912) emphasizes the value of pituitrin and **hypophysis** in amenorrhea, hypoplastic uterus and undeveloped ovaries. In most of his cases the author had success in bringing about the desired result after a few injections of pituitrin. In about one-third of his cases it was necessary to repeat the injection for a longer period.

Rushmore (Boston Med. and Surg. Jour., Mar. 2, 1916) reports 20 cases treated by hypodermic injections of **pituitrin** or **hypophysin**. He has seen no bad effects, and a sufficient number of cases have been cured or improved to make the treatment worth trying, though, as he says, not all cases of amenorrhea without obvious cause are due to defective secretion of the hypophysis.

potassium permanganate in, i. 605
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scarifying of cervix in, i. 605
sea bathing in, i. 606
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vaginal injections in, i. 605
warm baths in, i. 605
anemic, iron in, vi. 85
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Amentia, see Idiocy, vii. 668, and this Index.
Amidine, v. 537
Amidoacetphenetidin hydrochloride, see Phenocoll Hydrochloride, vii. 437
Amimia, ii. 48
Aminoform, v. 519
Ammonia, i. 606

Therapeutics, i. 610.—Black (Lancet, Feb. 12, 1916) calls attention to the effectiveness of an ammonia enema in the treatment of post-operative ileus and intestinal paresis. He uses liquor ammoniæ fort. 1 dram (4 c.c.), of water 1 pint (500 c.c.), administered as an enema. Its effect is greatly enhanced, he finds, by a hypodermic of pituitary extract 1 c.c. (16 minims), half an hour previously. This treatment is sure to result in a good motion and discharge of excessive flatus. He warns, however, against the frequent use of ammonia and of stronger solutions.

poisoning, i. 609
artificial respiration in, i. 610
atropine in, i. 610
coffee in, i. 610
digitalis in, i. 610
elm-bark infusion in, i. 610
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starch paste in, i. 610
stomach-pump in, i. 610
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tragacanth mucilage in, i. 610
vinegar in, i. 610
white of egg in, i. 610
Ammoniated mercury, vi. 652, 674
Ammoniemia, vi. 179
Ammonioformaldehyde, iv. 736
Ammonium, i. 612

Physiological action, i. 612.—McGuigan (Jour. of Pharm. and Exper. Therap., July, 1913) finds that traces of ammonium are excreted and probably absorbed normally by the lungs. Its excretion is shown by the increase in the ammonium content of the fluid of the lung. The proof, therefore, that chloride of ammonium and other salts, like the carbonates, act as stimulant expectorants seems to be near at hand, and clinical therapeutics receives additional support from experimental investigation.

bromide, see Bromine and Bromides, ii. 635
chloride, i. 617

Recalling that ammonium chloride had been denied an expectorant action in the usual therapeutic doses in bronchitis, Coleman (Amer. Jour. Med. Sci., Oct., 1916) reinvestigated its action on the bronchial secretion in man. Patients with acute or chronic bronchitis were selected and their sputum examined for the ammonia nitrogen content, and the resulting subjective symptoms studied. His conclusions were that ammonium chloride is an expectorant within the definition of the term, and that it probably acts by increasing the secretion of water thereby softening the mucus.

Abraham Jacobi (Trans. Assoc. Amer. Phys.; N. Y. Med. Jour., Jan.

6, 1917) had long urged that ammonium chloride did not have the expectorant value of the carbonate or the acetate. S. J. Meltzer held that the observation that a given substance was absent from a secretion was not evidence that the substance had no effect on the secretion; it may have had some effect on something in the blood. Physicians should not give up something that good clinical observers had found useful on the basis of mere experimental evidence. His own observation for many years had been that ammonium chloride was beneficial in a cold. It would not save a patient destined to die, but it was a good palliative remedy.

ichthyol group, see Ichthyol, v. 633

Amnesia.

Loss of memory, likewise includes failures of memory of various kinds, both temporary and permanent, or presenting special characteristics, as in the amnesic aphasias. It applies also to a loss of the power to recall facts of every kind, covering a definite period, or the entire life of the subject. In a case following prolonged alcoholic stupor reported by A. C. Buckley (Jour. of Abnormal Psych., Feb.-Mar., 1912), there was a loss of recollection of all events of the life of the individual—he remembered nothing up to a definite point. Nevertheless, he possessed a remarkable degree of tenacity of memory for all events which followed his comparatively abrupt psychic awakening. This was shown by his ability to recall and retain all recent events when once they were brought to his attention. The reeducation process was for him a laborious one, covering a period of many months, and to those who had the opportunity to observe him, it was most interesting.

S. P. Goodhart (Jour. Amer. Med. Assoc., Dec. 27, 1913) observed 2 cases of temporary amnesia, 1 from the excessive use of tobacco, the other a result of malarial infection. The first patient was a prominent lawyer and teacher, an habitual user of strong tobacco, who had indulged in unusual excess on account of recent mental and emotional stress. The amnesia appeared suddenly with a dazed condition for a half hour, followed by three weeks of nearly complete forgetfulness of past and current events, but apparently without any mental symptoms other than those dependent on the amnesia. Then it gradually began to disappear, but the complete rehabilitation was as sudden as the onset, and seemed to take up the normal mental activity at the point where it had been interrupted. Withdrawal of tobacco, rest and nutritional care were all the treatment used. This was several years ago; since then slight amnesic attacks have followed excessive use of tobacco and have been relieved by similar treatment. The second patient was a female teacher, aged 27, whose mother suffered from epilepsy and who was herself somewhat highstrung and nervous. The attack, in this case, was sudden, after intense emotional strain and fatigue, and was immediately preceded by severe headache. The amnesia was complete for the events of the previous 48 hours, but less so for events more remote. Malarial symptoms appeared two days later, and the case was a typical tertian with finding of the plasmodium. The amnesia continued a prolonged period after malarial symptoms ceased, and there is yet only partial restoration of past recollections.

Alfred Gordon (Med. Rec., Nov. 27, 1915) reported a case of verbal amnesia and alexia. The patient had difficulty in naming objects, and when he made a mistake he was at once aware of the error. He had no difficulty, however, in repeating names mentioned to him, and here again he appreciated their proper application. He could read letters but not words. Death resulted and autopsy disclosed a neoplasm of the left occipital lobe.

Ampulla of Vater, cancer of, pancreatic opotherapy as diagnostic test in, vii. 299
Amputations, vii. 795
  beta-eucaine anesthesia in, iv. 702
  cocaine anesthesia in, iii. 495
  drainage and closure of wound, vii. 798
  flap, vii. 797
  hemorrhage, permanent control of, vii. 798
    preliminary control of, vii. 795
  indications, vii. 795

J. E. Pirrung (Lancet-Clinic, Nov. 14, 1914) asserts that most patients become mentally depressed and discontented after an amputation. Amputation of extremities is justifiable only where the blood-supply has been cut off through rupture of the vessels. With the newer methods of treatment, vessel suture, bone transplantation, and serums and vaccines, these patients should be given every possible chance.

  infiltration anesthesia in, iii. 499
  instruments, vii. 797
  methods, vii. 797

One of the most important contributions of recent times is a study of the functional status of amputation stumps in the war by Tuffier (Surg., Gynec., and Obstet., Aug., 1916) based on his own experience and many reports, the whole aggregating over 1000 thigh amputations; 500 leg amputations; 500 arm amputations; 251 forearm amputations; 125 disarticulations of the shoulder-joint; and 58 disarticulations of the hip-joint. It demonstrated that a considerable percentage had to be operated 2 or more times, and that after amputation a mutilated soldier had 30 out of 100 chances of having to submit to a new operation. The reamputations usually involved the lower extremity, being generally called for because of the classical circular incision. The lesions which rendered an amputation stump unfit for an artificial limb were, in order of frequency: incomplete cicatrization by ulceration or fistula; pains, spontaneous or provoked by the apparatus pressure; often the entities combined. The ulcerations were often caused by too short or scant flaps, or diseased bone or nerves and lack of post-operative care. All urgent amputations being as a rule, infected, periosteal denudation should be carefully avoided, being unnecessary and dangerous. Caries and necrosis were common reasons for reamputation.

The practical conclusions drawn by Tuffier for each variety of amputation are as follows:

A *hip amputation* should be made as low as possible, leverage being of cardinal importance, especially in the upper third of the femur. A stump of 10 cm. is the minimum required for the prosthetic apparatus. A femur 14 to 15 cm. long is necessary.

A *sub-* or *intra- trochanteric amputation,* or the upper fourth of the femur, is hard to fit with an apparatus and the amputated walk on the pelvis. It should, however, not be abandoned. To diminish the inconvenience the femur should be straightened as much as possible during the healing of the wound.

Circular amputations give cicatrices which have all defects: seat, form, and adherence, and afford deplorable results. A number of such stumps cannot be fitted with artificial limbs, and they require 1 or 2 reamputations. Although a posterior flap may leave a stump a little too large it can be reduced by compression. An anterior flap or a combination of 2 flaps should be preferred; an external flap gives acceptable cicatrices.

Leg amputations immediately below the articulation give good general results. All leg amputations should give a cicatrix that will allow for a point of support on the stump directly or on the tibial notches, and should be performed as low as possible.

As shown by dozens of radiographs, the fibula is cut much too low, far under the tibia. High sectioning of the fibula is advisable. When the amputation is to be done, less than 8 cm. from the knee, it is best to cut the bones higher than lower. Very high cutting, even in the tuberosity of the tibia, gives excellent results. In all such amputations it is advisable to provide for the perfect mobility of the knee, and to direct the cicatrization of the soft parts by elastic molds or by traction.

Tibiotarsal disarticulation, with the cutting of the malleoli as well as the *intramalleolar amputation,* gives good results. *Subastragalus amputation,* gives good results. *Subastragalus disarticulation,* the *osteoplastic amputation of the calcaneus,* and the *Syme operation* are recommended. They all permit the ready fitting of artificial appliances which the stump bears without trouble.

Skirving (Jour. Royal Army Med. Corps, May, 1916) having seen many stumps which required reamputation because the skin turned in, leaving bare the bone and at times causing retention of pus, urges that plenty of bone be taken off. In the reamputations the vessels were hard to catch owing to the hard inflammatory tissue in which they were embedded and secondary hemorrhage was fairly common. Drainage should be free; inasmuch as the wounds were usually actively infected they were best treated by continuous irrigation. Traction on flaps was required to prevent a recurrence of the skin growing in.

No secondary amputations should be performed in cases of guillotine amputations, according to Huggins (Lancet, Apr. 28, 1917), until all edema has disappeared and skin extension has been employed for six weeks. Guillotine amputation stumps above the middle of the leg or middle of the thigh should never be shortened until healed unless it is decided that the knee-joint or hip must be sacrificed. When shortening has to be done the minimum amount of bone necessary for utilizing the joint above should always be borne in mind. A guillotine amputation may make a satisfactory stump in the leg and thigh, and almost always does in the forearm and arm without further reamputation. Bone in a stump does not undergo necrosis unless it is infected.

The aperiosteal method in amputations is advocated by H. H. M. Lyle (Jour. Amer. Med. Assoc., Oct. 3, 1914). In the Hirsch-Bunge method, with which he had almost perfect results, 1 centimeter of the periosteum and medulla is removed from the sawed end of the bone. The painful bony outgrowths resulting from the ordinary "periosteal" method (stripping up periosteum cuffs to cover the bone) are thus avoided. The aim is to produce early a weight-bearing stump. As soon as the wound heals, massage and a 2 per cent. salicylic acid ointment are applied daily. The patient is started walking on the stump early, using an ordinary peg leg after 16 to 18 days.

To provide for emergencies, J. L. Thomas (Brit. Med. Jour., Oct. 7, 1916) recommends, instead of the circular amputations, the following method which he states minimizes the pain of stump dressings and precludes the need of reamputation: Two lateral longitudinal incisions are made down to the bone on opposite sides of the point chosen for amputation and at the level of their distal ends a circular incision is made through the soft parts. The 2 flaps are then pulled up and the bone sawed through at a higher level. The flaps are then pulled down and the gauze wrung out of either Wright's hypertonic salt solution or Dakin's solution, allowing the flaps to meet firmly over the packing. The flaps are secured in position by 3 strips of self-adhesive strapping and the ends of the gauze are allowed to project at each corner through the lateral incisions. The stump is then covered with a dressing of sterile gauze and a bandage. The ordinary rubber drainage tubes, whether large or small, must not be used. In some cases, but only rarely, a few interrupted sutures of silkworm gut may be inserted to reinforce the strapping.

Amputations (*continued*).

at knee-joint, vii. 804, 805

C. E. Philips (Jour. Amer. Med. Assoc., Jan. 6, 1912) has recommended a method of knee-joint amputation which consists, after disarticulation, in leaving the patella attached to the anterior flap, sawing off its posterior surface and its sides with a bevel, and fitting it into a notch between the condyles of the femur. The resulting large bearing surface easily stands the full weight of the body. According to Tuffier (*loc. cit.*), knee dislocations proper, with or without consideration of the patella, generally give poor results, owing to adhesion of the skin to the atrophied cartilages; an intracondylar operation is therefore preferable. He quotes Desfosses as having had excellent results from Gritti's operation, consisting of fixation of the patella under the femoral stump and its suture to the posterior hip muscles. Openshow (*loc. cit.*), in amputations through the knee-joint, uses the method of Stephen Smith, in which two lateral flaps are made and the cartilages of the knee-joint and the patella are left.

at mediotarsal, vii. 802

A feature of surgical practice in the European war has been the revival of this older method of amputation. All tissues of the limb are *divided at one level*—the lowest possible—the muscles being cut at the level to which the skin retracts. The nerves, however, are pulled down and cut short. Fitzmaurice-Kelly (Lancet, Jan. 2, 1915) enumerates the advantages as follows: (1) Economy of tissue. (2) Applicability to otherwise hopeless cases, such as wounds or gangrene at the root of the limbs, in which the prognosis is much better than after hip or shoulder disarticulation. (3) Brevity of the operation, with very little shock. (4) Reduction of the surface from which septic absorption can occur, with free drainage. (5) Simplicity, an experienced surgeon not being needed for its performance. The division can be made at the margin of gangrenous tissue without, apparently, any danger of the gangrene spreading to the stump. A disadvantage is that a second operation is required, but this can be postponed until infection has disappeared. C. G. Watson (Brit. Med. Jour., April 1, 1916) mentions as additional advantages over the flap method a greatly diminished risk of secondary hemorrhage, a good mechanical relief of gas tension, and prevention of the spread of infection and septicemia. Where fracture coexists the bone should be left intact and projecting beyond the plane of amputation, thus minimizing the risk of osteomyelitis and providing a useful medium for moving and fixing the limb and applying extension to the skin. At the second operation, muscle planes should not be opened up to avoid flare-ups. The muscles are carefully snipped up from the periosteum for the required distance, and if laceration of the granulation tissue is avoided the operation can be done without any local or general reaction. The second operation should precede any serious cicatricial contraction. In several cases a comfortable stump was secured in a month after the first operation. Between the two operations the skin should be kept stretched by means of an extension device. C. W. G. Bryan (Brit. Med. Jour., i. 480, 1916) describes such an apparatus, which consists of strips of 2-inch adhesive applied from the joint above to the edge of the stump, prolonged about 12 inches beyond the latter, and attached to an aluminum ring 18 inches in diameter. Three equidistant cords from this ring are passed over pulleys and weights hooked on to their free ends—8 pounds for the thigh and 5 pounds for the arm.

M. F. Kelly (Brit. Jour. of Surg., iii, 676, 1916) advocates *flapless amputation in gas gangrene,* compound comminuted fracture, and multiple wounds. G. A. Wright (Lancet, Oct.

9, 1915) has noted difficulty in the healing of the flapless stumps, and suggests, in cases other than gas gangrene, the making of flaps to be kept open for a time and brought together when conditions permit.

at metacarpophalangeal joints, vii. 798
  circular, vii. 797
for senile gangrene, **cocaine anesthesia** in, iii. 495
interilioabdominal, vii. 808
interpelvi-abdominal,

Pringle (Brit. Jour. of Surg., Oct., 1916) enumerates the following indications for this operation: 1, neoplasms arising from (*a*) the hip bone; (*b*) the femur so high up that the disease cannot be removed by an exarticulation at the hip joint; (*c*) muscles or fascia in the region of the hip; 2, infective processes involving the hip bone: (*a*) tuberculous disease; (*b*) acute osteomyelitis; (*c*) actinomycosis might possibly justify the operation in some rare instances. In the majority of the cases the operation has been carried out in one stage, namely, removal of the limb along with the hip bone; but in a few it has been done in two stages—exarticulation at the hip joint, followed by the removal of the hip bone at a later date. The factors which should determine which of these procedures is the correct one to follow in the case of tuberculous disease are, (1) the extent of the disease, and (2) the state of the patient at the time of operation. In a total of forty-three cases there is a mortality of 58.1 per cent.

interscapulothoracic, vii. 801

For the interscapulothoracic amputation of the upper extremity, J. E. Jennings (Bull. Dept. Public Charities, i. 36, 1916; Surg., Gynec. and Obstet., Mar., 1916) recommends the following procedure:

Incision is begun over the junction of the middle and outer third of the clavicle downward and outward at right angles to the fibers of the pectoralis major to the midaxillary line; the pectoralis major is cut across; the pectoralis minor cut close to the coracoid; the subclavian vessels are isolated and tied; the brachial plexus is injected with 1 per cent. cocaine, and cut. The incision is carried inward along the line of the clavicle and the flap is dissected back. The clavicle is cut at its middle third, and the incision is carried downward and backward around the shoulder to meet the anterior incision in the midaxillary line; the trapezius is cut; the rhomboid, teres minor, and latissimus dorsi are cut; and the skin is closed with silkworm-gut sutures, and a rubber drain is placed through the stab wound in the lower angle.

of ankle-joint, vii. 803

In 7 cases C. G. Watson (Brit. Jour. Surg., Jan., 1915) had excellent results from an operation the main principles of which consist in leaving the original surface of the walking heel intact, while amputating the foot in front of the os calcis, together with the astragalus. The cartilaginous surfaces of the lower ends of the tibia and fibula and of the upper surface of the os calcis are removed, and the os calcis wedged between the malleoli and held there with an excision pin driven through the heel (to be removed in about a fortnight). The shortening of the limb is thus reduced to 1 inch, weight can soon be borne on it, and an ordinary boot can be worn if the sole is stiffened with a sheet of metal and a block provided for the toes.

of arm, vii. 800

All amputations of the *arm*, according to W. L. Estes (Annals of Surg., July, 1913), including those at the elbow, may be done by a circular or modified circular method. The adjustment of the flaps may usually be in an anteroposterior direction. Retraction of the anterior part of the flap at the *elbow* will convert a circular into an oval-shaped flap, thus bringing the line of union some distance above the end of the bone. At the *shoulder joint* also, anteroposterior flaps are preferred, the anterior flaps including most of the deltoid muscle and being longer than the posterior. The incision on the inner aspect of the limb should give easy access to the axillary vessels, which should be quickly grasped and controlled. For the *forearm,* the posterior flap should be one-fourth longer than the anterior. Ducroquet (Presse méd., July 20, 1916) describes various kinds of prosthetic apparatus to enable men with forearm amputation to work at their trades. One piece of the apparatus covers and protects the stump, and there should also be an armlet for the upper arm, a hinge mechanism connecting the two, and perhaps also a sling over the shoulder. Special distal pieces are described for gardeners, vinedressers, chauffeurs, carpenters, brushmakers, etc. The commercial traveler requires no technical prosthesis, but a specially articulated hand with prehensile power. Tuffier (Arch. de méd. et pharm. Milit., 1916) warns against amputating the forearm too close to the elbow. Either the circular or flap method gives good results, provided the scar is pliable and free. The newer forms of apparatus help to conserve the movements of pronation and supination. Throughout healing the mobility of the elbow and radioulnar joints should be carefully watched.

of breast, cocaine anesthesia in, iii. 495
of elbow, vii. 800
of finger, ethyl chloride anesthesia in, iv. 698
  little, vii. 799
of forearm, vii. 799
of hip-joint, vii. 805

Amputation at the hip-joint, according to T. H. Openshaw (Practitioner, xcvi, 284, 1916), is best performed by first ligating the femoral vessels, next disarticulating the hip, and then finishing the amputation. This type of operation gives a triangular scar, and the stump is readily fitted to an artificial leg. A long, flabby stump in hip cases is annoying.

Amputations (*continued*).
of leg, vii. 803

J. F. Binnie (Med. Rec., Apr. 25, 1914) points out that where a patient can afford a good artificial limb amputation of the leg is preferable to operations of the Syme or Pirogoff type. Hirsch and Bunge's aperiosteal treatment of the bony stump in any amputation, and Bier's osteoplastic amputation under particularly favorable circumstances, are valuable means toward obtaining ideal weight-bearing stumps. All the advantages of Bier's operation can, however, be more easily obtained by covering the cut end of the tibia with a free transplant of bone. A plate of the tibia, with ½ inch of periosteum hanging from its upper and lower edges like a tablecloth, is cut from the bone below the site of amputation and placed in salt solution. The amputation is then completed, after forming a periosteal cuff on the tibia, and the transplant placed over the cut bone and fixed there with periosteal sutures. If desired, the bone plate may be made long enough to bridge across and cover both tibia and fibula. For success of the method certain asepsis and satisfactory resisting power of the patient are prerequisites. J. Ballner (Wiener klin. Woch., Mar. 18, 1915) prefers Bunge's aperiosteal method to the Bier osteoplastic procedure because it is simpler and yields a less sensitive stump.

Durand, of Lyons (Internat. Surg. Cong.; N. Y. Med. Jour., Apr. 18, 1914), points out that amputations of the leg above the middle part have ceased to deserve the name of amputation at the site of election, and should, where possible, no longer be performed. This is due to the great progress made in prosthetic methods. Supramalleolar amputations and amputations at the lower third of the leg, with provision of solid skin tissues from the heel, sometimes permit of direct pressure of the stump extremity on the apparatus, and the usefulness of the limb remains very similar to that of tibiotarsal disarticulation. Amputations in the middle third do not admit of this terminal weight bearing, though osteoplastic methods may improve their results. R. Finochietto (Annals of Surg., 616, 1915) deems placing the patients in the dorsal decubitus convenient in operation, examination, and dressing in the upper two-thirds of the leg. Tuffier (Arch. de méd. et pharm. milit., 1916) points out that the scar in leg amputations should be so situated as to allow for support on the stump directly. The amputation should be as low as is compatible with the cutting of a good flap. The fibula should be cut high. War experience has shown that an external flap gives acceptable scars, while results from the circular method are generally deplorable. Disarticulation, with cutting of the malleoli, as well as the intramalleolar amputation, give good results.

Chaput (Presse méd., Jan. 11, 1917) obtained good results from a **three-flap amputation** of the leg in 10 cases. A short antero-internal flap is cut, together with 2 longer flaps, 1 antero-external and the other posterior. This operation requires much less flap tissue than those based on a single external or posterior flap, and is much safer as regards gangrene than a circular amputation or one with 2 equal flaps because of the shortness of the antero-internal flap already mentioned. An excellent stump is provided.

of limbs, cocaine **anesthesia** in, iii. 484
of metacarpus, vii. 799
of penis, vii. 345
of shoulder, vii. 800
of thigh, vii. 805

Tuffier (*loc. cit.*), reviewing the results in 1063 thigh amputations, asserts that while an amputation in the upper fourth of the femur is harder to fit with an apparatus than a disarticulation of the hip-joint, and yields no better functional results, it is of value in that the immediate operative danger is less. The femur should be straightened as much as possible during healing of the wound. For good motion at the hip-joint the femur in thigh amputation must be left 14 to 15 cm. long; to permit the use of the apparatus at all, it must be at least 10 cm. long. Circular thigh amputation is faulty; an anterior flap or combination of two flaps is the method of choice, and should therefore be employed unless the lower bone section feasible in the circular method renders the latter advisable in the individual case. The process of scar formation should be carefully directed by means calculated to approximate and exert traction upon the flaps. The sciatic nerve must be cut high up. Intracondylar amputations give good ambulatory results. Cotte (Lyon chir., Nov., 1912) had good results in 2 cases of amputation above the knee from attaching a thin tibial plate, or the epiphysis of the tibia, to the stump of the femur, thus improving the capacity for direct weight-bearing.

Savariaud (Bull. de l'Acad. de ing. Savariaud (Bull. de l'Acad. de méd., July 13, 1915), in wounded, pulseless cases requiring thigh amputation, obviates *shock* by applying a rubber tube tightly at the root of the limb or round the waist and by injecting 2 or 3 pints (1000 to 1500 c.c.) of warm normal saline solution into the circulation in a few minutes' time through a conical cannula introduced in the gaping femoral vein as soon as amputation has been effected. The difficulty and slowness of infusion at the elbow is avoided, and the resulting bleeding from small arteries in the stump permits better hemostasis.

Depage (Presse méd., May 25, 1916) earnestly reproaches *crutches* with altering static conditions of the body, immobilizing the stump, and injuring the brachial plexus, and advises instead the use of an artificial limb made of plaster in which are imbedded strips of metallic netting, with a peg leg below. The upper portion is renewed at intervals as the stump retracts, and a true artificial limb substituted when the ultimate permanent condition of the stump has been reached.

Mosti (Gaz. degli Osped., Mar. 15, 1917) advocates cutting through the limb as one slices sausage, as an excellent technique for emergency cases of war wounds. It saves life, even though a defective stump to improve later. As the posterior-internal thigh muscles retract more powerfully than the anterior-external, he lowers the line of amputation 4 or 5 cm. on the posterior internal side of the thigh, thus allowing for retraction. This technique, followed by extension, has given good results while saving many doomed lives. In many instances the stumps were excellent.

stump, vii. 798

Thompson (Va. Med. Semi-Mthly., Mar. 8, 1912) recommends, from the standpoint of stump utility for the legs, the *bilateral skin flap*. The line of union, instead of extending across the end of the tibia, thus lies between the ends of the two bones, thereby reducing greatly the tendency toward adhesions. Periosteal flaps should be made for both bones.

Witzel (N. Y. Med. Jour., Apr. 18, 1914), to obtain good stumps, recommends disarticulations and epiphyseal amputations, or sealing or avoidance of opening of the marrow canal; prevention of neuroma by fixation of nerve roots on the surface of the sectioned bone; massage and early utilization of the stump in a temporary apparatus. Suture of neighboring muscles together is helpful for maintaining functional equilibrium in the utilization of the stump as a lever operating prosthetic devices.

Ranzi (N. Y. Med. Jour., Apr. 18, 1914) lays stress on *prevention of excessive callous formation* on the bone stump, and prefers Bunge's method of accomplishing this by removal of periosteum and endosteum on the stump end to other procedures, such as those of Bier and Wilms, who close the marrow opening with an osteoperiosteal flap and with fascia, respectively. P. Lockhart Mummery (Brit. Med. Jour., June 5, 1915) warns against a posterior scar in leg amputations, this being the area of greatest friction when the artificial leg is applied.

Openshaw (Practitioner, xcvi, 284, 1916) enumerates the conditions, including *painful stump*, which may prevent the fitting of an artificial leg as follows: Painful bulbous nerves; necrosis of the bone; sinus leading to bone or foreign body; inflammation; dense adherent, or eczematous scars; ulceration; loose or flabby stump, or too fat a stump; contracted limb. Tuffier (*loc. cit.*), writing war experiences, quotes Estor's statistics as showing 90.5 per cent. of good stumps in the case of the upper extremity, 68 per cent. good thigh stumps, and 53 per cent. good leg stumps. The lesions rendering a stump unfit for an artificial limb in 30.9 per cent. of all cases are, in the order of frequency, incomplete cicatrization through ulceration or sinus formation; pains, spontaneous or provoked by apparatus; or these two combined. With the X-rays Tuffier found dozens of stumps suppurating because of free sequestra, immediate healing following their removal. Periosteal denudation is, in view of this, dangerous as well as unnecessary. Radiograms of other cases showed an osteomyelitis—frequently in the femur,—terminal or lateral, these stumps remaining tense, hard, and painful. To avoid this condition, early disinfection of all war wounds is necessary. Neuritic pain, occurring in the absence of X-ray bone changes, may be due to compression in the cicatrix, pressure over the latter eliciting it, or to stretching of the nerve upon a bone, in which case the maximum pain is found at the point of traction itself. In the first case the scar should be removed and the neuroma found; in the second, the muscle should be incised and the nerve resected. Closer attention to the joint adjoining an amputation is urged. The knee, *e.g.*, should be kept extended as often and as long as possible, and in the case of the shoulder, movements should be practised before the stump heals.

Hirsch having shown that amputation stumps can be made weight-bearing by means of **baths, massage,** and **stepping exercises,** V. Schaldemose (Tr. xi North Surg. Cong., Goeteborg, July, 1916; Surg., Gynec. and Obstet., Jan., 1917) tried his principle in 10 cases of leg amputation. In doing the latter he provided a large posterior musculocutaneous flap, divided the periosteum and bone at the same level; sutured in 2 layers; applied a small drain which he removed on the fourth day. On the tenth to twelfth day stepping exercises are begun, first in bed, later with the patient sitting down. The unpleasant sensations are soon overcome. In the third to the sixth week a provisional prothesis made of wood and plaster of Paris is applied, and after the second or third month the final one. All 10 patients are now walking, the stump bearing their weight.

subastragaloid operation, vii. 803
through metatarsus, vii. 802
through phalanx, vii. 798
through tarsometatarsus, vii. 802

W. L. Estes (Annals of Surg., July, 1913) notes an increasing tendency to resort to mediotarsal or tarsal rather than Syme's or low leg amputations where amputation of the foot is required. Adequate flaps must, however, be obtained and the anterior tendons cut long enough to be sutured to the posterior flap when forming the stump. Durand (*loc. cit.*) recommends amputations and disarticulations involving the anterior tarsus without suppressing it entirely. The results are very similar to those of Lisfranc's disarticulation. Chopart's operation on the contrary is unreliable, risking reversion of the stump, and is rarely indicated. The subastragaloid disarticulation is an excellent procedure.

Tuffier (Arch. de méd. et de pharm. milit., 1916), writing from military experience, states that in war surgery, suppuration being the rule, the Chopart operation is to be discarded; to improve results from this procedure he has to perform two astragalectomies with calcaneal osteoplasty. In many so-called Chopart operations the scaphoid has been forgotten. Lisfranc's and similar amputations give good stumps on which the patient, with an orthopedic shoe, can walk easily and even gracefully. A number of amputations of this type were done for frozen feet. Tuffier also recommends subastragaloid disarticulation, osteoplastic amputation of the os calcis, and the Syme operation; the fitting with apparatus is easy and the stump tolerant.

Quénu (Bull. et mém. de la Soc de chir. de Paris, xlii, 538, 1916) warns against hasty amputation in gunshot injuries of the foot, even when severe. Any amputation performed should be done through healthy tissues. To be sure, if the operation is done early, union by first intention and rapid return of functions of the foot may be obtained, even in articular wounds. If there is joint suppuration amputation may be necessitated by difficulty of drainage, but the operation should be confined to a plane section in the infected joint. The final plastic restoration should be delayed for several weeks, this facilitating an economical operation. As much of the calcaneum as possible should be preserved. Quénu approves of the Pirogoff operation, with or without modifications.

thumb, vii. 799
toes, vii. 802

Durand (N. Y. Med. Jour., Apr. 18, 1914) states that one of the last four toes may be amputated either by disarticulation of the second phalanx, metatarsophalangeal disarticulation, or amputation in continuity of the first phalanx. No other procedure is to be recommended. The great toe is amenable to all operations in continuity or contiguity. Total disarticulation, especially by the subperiosteal method, gives excellent results. Simultaneous disarticulation of the five toes makes but little difference in the patient's walk. Schapps (Med. Rec., Sept. 25, 1915) obviates the disability often following amputation of the great toe by avoiding removal of the tendons. These he approximates over the stump, thus retaining the muscular function of the arch of the foot.

  ethyl chloride in, iv. 698
 wrist, vii. 799
Amygdalectomy, see Tonsillectomy, vii. 416, 417
Amygdalitis, see Tonsillitis, Acute, vii. 414
Amyl nitrite, vii. 47
 valerate, i. 624
Amylene chloral, see Dormiol, iv. 336
 hydrate, i. 621
Amyloform, i. 623
Amyloid disease of the conjunctiva, iii. 589
 kidneys, vi. 187, 188
 spleen, viii. 306
Amyotonia congenita, vi. 754

Powis and Raper (Quarterly Jour. of Med., Oct., 1916—Jan., 1917) studied the metabolism of a case of amyotonia congenita. They found diminution of hepatic functional activity as shown by acholia; a normal calcium retention associated with a relatively high potassium retention; a low creatinin excretion, and a relatively high creatin excretion. The use of **bile salts** or **dried ox bile** caused an increase in muscular strength and restored in part the normal ratio of the potassium to calcium retention.

  iron in, vi. 755
  massage in, vi. 755
  passive movements in, vi. 755
  quinine in, vi. 755
  strychnine in, vi. 755
Amyotrophic lateral sclerosis, see Lateral Sclerosis, Amyotrophic, viii. 237
Anacidity, viii. 333
Anakhre, see Goundou, v. 75
Anal excoriations, **tannin** in, viii. 498
Anal fissure, vii. 734

According to R. H. Barnes (Transactions Amer. Pract. Soc., Surg., Gynec. and Obstet., Nov., 1916), fissure is an ulcer due primarily to local inflammation. They thus become frail and easily torn. This inflammatory disorder is frequently the result of an excessive carbohydrate diet and sometimes an excessive fat diet. He recommends **reduction of carbohydrates and fats** and placing the patient on a **proteid diet** for a time. He advocates **drainage** rather than paralyzing the muscular fibers by operation, and the use of a small **enema** before defecation to avoid irritation from the stool, and keeping the wound clean by **hot sitz baths** and the **hot enema.**

J. Drueck (Inter. Jour. of Surg., Oct., 1916) advocates **rest and drainage,** keeping the bowels open—if possible by **diet** or with enemas of **olive oil** or **glycerin suppositories.** Laxatives are contraindicated. In *recent fissures,* before the wound edges are thickened, the anus, and, if possible, the ulcer, is sprayed with a 4 per cent. solution of **cocaine** in 1 : 1000 **adrenalin chloride solution** allowed to remain 5 minutes. A conical fenestrated speculum is then inserted, bringing the fissure into view. It is sprayed with cocaine if not previously reached, and painted with **silver nitrate solution,** 20 grains to the ounce, or with **pure ichthyol.** A cure should be effected in from 2 to 4 weeks. If not obtained within this time surgical treatment should be resorted to.

  aperients, mild, in, vii. 737
  belladonna in, ii. 449
  belladonna ointment in, ii. 444
  benzoin tincture in, ii. 456
  Bier's hyperemia in, v. 597, 598
  carbolic acid in, vii. 738
  chloral hydrate in, iii. 211
  cleanliness, rigid, in, vii. 738
  cocaine in, iii. 481, 490; vii. 738
  copper sulphate in, vii. 738

- Anal fissure (*continued*).
        - diet regulation in, vii. 737
        - enemas in, vii. 737
        - flaxseed-tea enema in, vii. 737
        - ichthyol in, v. 639; vii. 737
        - ichthyol ointment in, vii. 738
        - iodoform in, vi. 52
        - iodoform suppository in, vii. 737
        - krameria in, vi. 238
        - magnesium sulphate in, vi. 475
        - olive oil in, vii. 170
        - pepper confection in, vii. 361
        - phenolphthalein in, vii. 737
        - scarlet red in, vii. 738
        - silver nitrate in, vii. 738; viii. 136
        - staphylococcus vaccine in, ii. 364
        - sulphur in, viii. 428
        - tannin in, viii. 498
    - operative treatment, vii. 738
        - cautery in, vii. 738
        - dilatation, forcible, in, vii. 738
        - dilatation and incision in, vii. 739
            - blue mass in, vii. 739
            - creolin solution in, vii. 739
            - ichthyol ointment in, vii. 739
            - saline solution in, vii. 739
        - incision in, vii. 739
            - cocaine anesthesia in, vii. 739
            - removal of piles in, vii. 738
            - stovaine anesthesia in, viii. 398
        - mercury acid nitrate in, vii. 738
        - nitric acid, fuming, in, vii. 738
        - quinine and urea hydrochloride anesthesia in, iii. 393
- Anal fistula, see Fistula in Ano, vii. 740; also this Index.
    - ulceration (tuberculous), Bier's hyperemia in, v. 597, 598
- Analgen, i. 624
- Analgesin, see Antipyrin, ii. 27
- Anaphylaxis,

This term was introduced by Richet of Paris in 1902 to designate a peculiar power possessed by certain poisons of increasing the sensitiveness of an organism to their toxic action. Von Pirquet, on the plea that it implied absence of systemic defense, whereas the reaction was one occurring beside, though linked to, immunity, termed it *allergy,* meaning another or additional reaction. Until the nature of the process is better known, however, it is preferable to employ Richet's original term, since what it does mean is a condition of hypersensitiveness which may ultimately prove to be but a phase of immunity.

Symptoms.—Diphtheria and tetanus antitoxin and other sera, antityphoid, antidysenteric, antiplague streptococcic, etc., give rise, as is well known, to untoward effects which formerly were attributed to "idiosyncrasy," "supersensitiveness," etc. The various phenomena developed have been called *serum disease* by von Pirquet, though the term applies specifically to one syndrome following occasionally injections of horse serum, the proteins of which is the harmful factor. While, for example, the use of diphtheria antitoxin is, as a rule, devoid of danger, such hypersensitive persons, often owing to previous injections, the presence of asthma, and sometimes without apparent cause, become seriously ill—fatally so in some rare instances.

The interval between an injection and the appearance of the morbid symptoms may be but a few minutes, several days, or even weeks. As a rule, however, it occurs before the eleventh day. A second injection is thought to be safe, where the first injection has given rise to no untoward effect, within six days, but this rule cannot be accepted as infallible. The attack may consist only in more or less redness of the face or severe urticarial eruption over the face and body, with intense pruritus; but, as a rule, it is far more severe, there being fever, with leucocytosis, usually eosinophilic, swelling of the lymphatic glands, edema, pains in the joints and in the back, albuminuria, a marked rise of blood-pressure, followed in severe cases by a decline of pressure—usually a precursor of death.

The suddenness with which lethal symptoms appear is sometimes appalling. Thus some years ago E. L. Boone referred to "an apparently very strong and extremely well developed boy of 10 years who was given 4000 units of diphtheria antitoxin below the scapula. This was almost immediately followed by a loud cry of distress, strangling and choking cough, dyspnea, cyanosis, pallor about the lips, frothing at the mouth, a convulsion and death—all within 5 or 6 minutes." In another case, recorded by W. W. Hendricks, but 1000 units had been injected as a prophylactic, also in the scapular region, the child, a boy of 7 years, being perfectly well. "In 5 minutes," states the author, "the child was brought back unconscious . . . The skin was livid, the lips and nails blue, the lips and eyes swollen, the eyes half open, the pupils equally dilated, and the conjunctivæ injected. The jaws were firmly closed and a frothy mucus was found coming from the mouth and nose, the tongue was found swollen, and protruded when the jaws were forced open." These cases illustrate the fact that no evident disease may be present to warn the physician, and, moreover, that the smallness of the dose of diphtheria antitoxin may not prevent morbid effects.

As regards the development of untoward phenomena long after the initial treatment, Gillespie (Austral. Med. Gaz., June 22, 1912) records a case in which very serious symptoms were caused by the injection of antidiphtheritic serum about 18 months after a previous injection. The patient collapsed 15 minutes after the injection, became unconscious, vomited 5 times in 6 hours, had very shallow respiration, 35 to the minute, a pulse of very poor tension, 120, regular, and a temperature of 101.2° F. (38.4° C.). He began to recover consciousness at the end of 4 hours of active treatment, and made an uninterrupted recovery, except that on the sixth day an urticaria developed.

Such cases are *extremely rare*, however, so rare in fact, that some observers of vast experience have never witnessed it. This fact should be borne in mind, for Guaita (Semana Medica, Aug. 21, 1913) relates a number of instances in which the parents refused to permit the use of antitoxin in diphtheria for fear of anaphylaxis, as the child had been injected with antitoxin on some previous occasion. In all his experience, and in that of Penna at the contagious disease hospital, Cabrera's at the diphtheria pavilion in the children's hospital and of others he cites, no instance of anaphylaxis has been encountered, although some of the patients had received several injections of antitoxin. He declares that this dread of anaphylaxis is irrational and extremely dangerous.

Cutaneous eruptions, however, are relatively common. Thus, Sturtevant (Archives of Int. Med., Jan., 1916) in a series of 500 cases found that out of 422 which had received but one injection, 20 per cent. had an urticarial or erythematous rash. The reaction occurred as a rule between the fifth and ninth day, though occasionally as early as the first and late as the nineteenth day, this being in no way influenced by the dose. Nausea and vomiting occurred in 9 per cent. of the reacting cases, and was more likely to occur and to be severe and prolonged if the dose of serum was increased. Albuminuria and edema appeared occasionally, and joint symptoms, sometimes severe, in about 14 per cent. of the reacting cases. When a given amount of serum was administered in 2 or more doses, it seemed as likely to produce a reaction as a single injection.

The large proportion of untoward effects in Sturtevant's cases does not seem to attend the use of foreign sera. This is well shown by F. Cuno's experience (Deut. med. Woch., May 14, 1914) in 3500 children. Of these, 97 received second injections at intervals of from 1 to 114 months after the first administration; 11 received both second and third courses of injections with intervals of from 1 to 130 months between the several courses; and 96 children had repeated doses from 10 to 63 days after the primary. This makes 207 in all who had second courses of injections, and of these only 1 showed symptoms of anaphylactic response.

Scarlet fever serum seems also to be less benign in its effects. Thus Nemmser (Deut. med. Woch., Apr. 17, 1913) observed no anaphylactic symptoms in 3000 children at the Petrograd Hospital for Infectious Diseases, after a single prophylactic injection. In 1002 recorded cases which had received 2 or more injections, however, serum eruptions were mentioned in 42 cases, *i.e.*, less than ½ of 1 per cent. with no serious phenomena. This must depend greatly, however, upon the kind of serum used, for L. Axenow (Jahrbuch f. Kinderheilk., Nov., 1913) states that all the 683 cases of serum sickness observed in the children's hospital in Petrograd during 7½ years followed the treatment of scarlet fever with Moser's serum out of 1200 cases treated. It was much more frequent in children under 5 years of age than in older ones. There were 21 deaths (3 per cent.) due to serum sickness alone. There were 37 others in which besides the serum sickness there were other complications of scarlet fever, making the mortality 8.5 per cent. Serum sickness was also found to increase the severity of the complications. Serum treatment for scarlet fever should, therefore, be used, in his opinion, very cautiously and only in the severest cases.

In *alimentary anaphylaxis* we have a form caused, as its name indicates, by certain foods, notably eggs, milk, and mussels. As described by Laroche, C. Richet, Jr., and F. Saint-Girons (Paris Méd., Apr. 18, 1914), the symptoms in severe cases may appear from 15 seconds to 45 minutes, and usually consist at first of urticaria, violent cramps, or vomiting. Diarrhea almost always follows, and respiratory and nervous disturbances may also appear. Mild alimentary anaphylaxis is much more frequent, and may occur either in adults with previous slight intolerance to some single article of food, or in children the variety of whose diet is increased too suddenly. Thus a child of 3 to 5 years may have taken 2 or 3 eggs a day for some weeks or months; gradually there appear disturbances such as chronic indigestion, heavy breath, constipation or diarrhea and urticaria, prurigo, or eczema. The urticaria sometimes recurs after each meal, at other times is practically chronic. At times edema of the face, eyelids, or limbs appears. Excessive feeding and insufficiency of the digestive secretions appear to favor alimentary anaphylaxis. Although the quantities of food, *e.g.*, of egg albumin, required to bring on symptoms need be only trifling, the amounts necessary to establish the anaphylactic state are usually relatively large, at least 1 or 2 eggs daily in addition to the ordinary diet. Diagnostic features are the suddenness of symptoms, almost immediately after ingestion, and the fact that symptoms appear each time an attempt is made to accustom the subject to the food in question, no matter how small the quantity.

Anaphylaxis is thought to explain *various diseases of childhood.* Thus Pisek and Pease (Boston Med. and Surg. Jour., Jan. 25, 1912) hold that among these are many spasmodic conditions in children which have long been attributed to exaggerated irregularity of the children's system. The suddenness of their onset and the rapidity with which they disappear suggest that they belong to the group of anaphylactic reactions,—laryngeal spasm, tetany, eclampsia, certain forms of asthma, and some of the severer types of convulsive seizures, for example.

Among the diseases also attributed to anaphylaxis are *hay fever.* The newer literature upon this subject is given under Hyperesthetic Rhinitis, in this volume.

Diagnosis and Pathogenesis.—The symptoms of anaphylaxis include, we have seen, several pointing to involvement of the respiratory, vascular, cutaneous, and gastro-intestinal systems. The dyspnea and in severe cases apnea, and the resulting cyanosis have been found by Biedl and Kraus, Anderson and others, to be due to spasmodic contraction of the bronchial musculature—the identical causative feature of bronchial asthma. *Where asthma exists,* therefore, *anaphylaxis is likely to occur.* This symptom may appear not only in serum disease but sometimes in alimentary anaphylaxis as well, as shown by Talbot (Boston Med. and Surg. Jour., p. 708, 1914, and 191, 1916) Schloss (Am. Jour. of Dis. of Children, p. 346, 1916) and others, the vomiting, abdominal pain and diarrhea being but eliminatory phenomena.

The peripheral symptoms, cutaneous and vascular, are seemingly closely related, not only mutually, but also with the respiratory signs. The toxemia which in the lungs produced spasm of the bronchial musculature, likewise provokes spasm of the vascular muscles; hence the angioneurotic edema, of which the swelling of the lips, tongue, buccal mucosa, pharynx and esophagus are corresponding expressions. A similar constriction of the pupillary vessels causes the bilateral dilatation of the pupils. Far more dangerous in its effects, is the simultaneous contraction of the cardiac vessels among others and ischemia of the myocardium as result, the blood-pressure being at first high, then increasingly low, until prostration, collapse and death supervene, all in rapid succession. The urticaria, urticarial wheals, erythema and eczema are also the result of vascular spasm, their immediate cause being imprisoned wastes—ephemeral in some cases, persistent and grave in others.

[This interpretation of the pathogenesis of anaphylaxis summarizes personal studies of the subject. As we shall see below we are dealing from my viewpoint, with a vasomotor spasm, due undoubtedly to intermediate protein wastes—whether derived from horse serum, ingested foods or parenterally introduced proteins. Gay and Southard, Auer and Lewis, and others several years ago found that the asphyxia was due to tetanic contraction of the finer bronchioles, with alternating rise and fall of the blood-pressure. C. E. DE M. S.]

Various tests have been proposed to determine the identity of the protein to which a given subject may be sensitive—where undetermined foods provoke toxic phenomena.

The simplest of these is the *elimination test,* which consists in placing the patient on a bland diet known to produce no untoward effects, then adding thereto a suspected article of diet at a time at 3 or 4 days' intervals until the characteristic morbid effects are noted.

The *cutaneous test* is more satisfactory. The skin is abraded without drawing blood and an aqueous 5 per cent. solution of the suspected food or of pure proteins is rubbed in as in ordinary vaccination, controlling it by means of a 5 per cent. lactose in normal saline solution. An urticarial wheal with a pink areola appears in about 10 minutes and persists about 30 to 40 minutes.

The *intracutaneous test* (not *sub*cutaneous) is still more sensitive, but somewhat painful. A small drop of a 2 per cent. aqueous solution of pure protein is injected *into* the skin (not under it, as alarming symptoms might result) with a very fine needle, the syringe being laid almost flat on the arm. The same urticarial wheal with an erythematous areola, with, perhaps, a small papule, develops in about 24 hours if the reaction is positive.

Etiology and Pathology.—All proteins, living or dead, contain a poisonous substance which, under normal conditions, is destroyed in the gastro-intestinal canal in the course of digestion, during which the proteins are converted into the non-poisonous amino-acids. When, however, proteins, sera, eggs, milk, protozoa, bacteria, etc., are introduced otherwise than by way of the stomach and enteric canal, *i.e.*, parenterally, through the skin, the vessels, and perhaps the respiratory mucosa, wounds, etc., their toxicity is not eliminated, and it evokes, as antigen, a defensive reaction. The anaphylactic symptoms occur, however, when, after a first dose, generally termed the "sensitizing dose" of any kind of protein, is followed sometime later by a second dose—the "toxogenic dose." How are the morbid phenomena described brought about?

Many theories have been vouchsafed, but none so far have fully met all the phases of the problem. Richet thought the first dose caused the formation of "toxogenin" which, when the second dose was injected combined with the latter to form "apotoxin," the anaphylactic poison. While this earliest of the many theories proposed, including those of Gay and Southard, Besredka, and Vaughan and Wheeler, each of which supplied some elucidative feature, it formed the basis of Friedberger's second theory, which seems, at least, to account for most of the known facts. The first dose, he found, formed a toxic under the influence of the immune body increasingly developed by the animal after that dose. While this first poison is insufficiently active to awaken morbid phenomena, it increases greatly in quantity and virulence when the "toxogenic dose" is injected and becomes, together with the complement normally contained in the blood, the "anaphytotoxin" which causes the anaphylactic attack.

[While this theory best explains the formation of the anaphylactic poison, it does not explain—any more in fact than any other theories offered so far—the *manner* in which the poison produces *its effects*,—the "how," in other words, of the process. This brings us back to the personal view submitted in my foregoing commentary, that we are dealing with *an intense spasm of the vascular, cardiac and bronchial vessels* caused directly by the anaphylotoxin, as the main clinical feature of the morbid process, that which endangers life and upon which our therapeutic measures should be concentrated.—C. E. de M. S.].

Soula (Presse méd., Oct. 23, 1916) found experimentally profound changes in the lipoid formula of the nerve centers in the course of the period of anaphylactic sensitization. He attributes it to the action of the poison on the nervous system. The humoral reactions which have hitherto been considered as primary are probably only the result of the nervous lesions.

D. Klinkert (Nederlandsch Tijd. voor Genees., Jan. 27, 1917) holds that anaphylaxis is due to the fact that the nervous system in certain persons is exceptionally sensitive. This causes it to react to irritation more readily than in the normal subject. This may be due to a cumulative action of toxins. The only difference between an idiosyncrasy to a drug and the phenomena of anaphylaxis is one of degree.

M. I. Smith (Jour. Lab. and Clin. Med., i. 902, 1916) undertook a research to ascertain if possible the causes of the rise of temperature observed in anaphylactic animals. His experiments showed that it had nothing whatever to do with the glycogen metabolism, and that it was of an entirely different nature from neurogenic fever, but probably of the same nature as true infectious fever.

Prophylaxis.—Various measures have been proposed, but, of all, the most satisfactory when *diphtheria antitoxin* is to be used, is that advocated by William H. Park in 1912 (Med. Record, Nov. 22, 1913). Experimentally, he found that a single dose of antitoxin given after infection would save animals when the same and even larger amounts given in divided doses would utterly fail. Cases of diphtheria were treated with one massive subcutaneous injection of antitoxin in which the antitoxin content of the blood was tested from hour to hour. It was found to increase in all cases for the first 3 days. The apparent improvement following a second dose of antitoxin was shown to be due, partly to the continued absorption of the first injection, and partly to the necessary time required for recovery of the local process. When the first injection was of fair size, a second added no real effect. During 1912-1913, over 95 per cent. of all cases of diphtheria treated at the Willard Parker Hospital received but 1 injection of antitoxin. The mortality was the lowest in the history of the hospital. The usual amount given was 5000 units in the milder cases, 10,000 units in the moderate or rather severe cases, and 20,000 units in the malignant cases. In the latter, the antitoxin was given intravenously whenever possible. The same number of units given intravenously was fully fourfold the value of the same amount given subcutaneously. Intramuscular injections had the advantage over subcutaneous, in the rapidity of absorption, but when fairly large amounts were given, it was difficult to insure that the antitoxin remains within the muscle. As a rule cases not requiring intravenous injections could be treated by either the subcutaneous or intramuscular methods.

Concerning the danger of anaphylaxis from *primary subcutaneous injections*, the same author submits the results obtained by the New York Health Department. Over 30,000 cases of *diphtheria* had been treated with antitoxin since 1895 in the contagious disease hospitals. There had been no fatal cases of anaphylaxis and only one in which dangerous symptoms developed. In over 100,000 persons injected outside of the hospitals, there had been but 2 fatal cases, in 1 of which marked *status lymphaticus* existed. In a great many children in the *scarlet fever* service, a primary immunization injection of diphtheria antitoxin had been followed by a second larger subcutaneous injection at a period at which anaphylaxis should be marked. In no case had any dangerous symptoms developed. *Unless, therefore, there was a history of asthma,* there seemed no reason to avoid the giving of a primary serum injection on account of fear of later having to give another injection, either in the near future, or after a number of years.

[The words "status lymphaticus" and "asthma" are italicized because I consider the thymus as a leading malefactor in the lethal process. In a series of articles on this organ (New York Med. Jour., March 6, 1915 to Feb. 5, 1916 inclusive) I urged that under the influence of excessive feeding its sponge-like tissues became greatly engorged, in part by cellular elements. Since then Lesné and Dreyfus found that anaphylactic death could be prevented in highly sensitized animals by starving them 4 or 5 days before the toxogenic dose was administered. Again we know (see vol. viii, p. 535) that thymic death may occur during swimming, dancing, coitus, etc. From my viewpoint this is the result of a temporary rise of blood-pressure which causes sufficient congestion of an enlarged thymus to cause asphyxia by compressing the trachea—a factor which should be borne in mind in the present connection. Asthma and status lymphaticus are important danger signals; but they are not always present, even though the thymus be greatly enlarged. The diagnostic signs of enlargement are described on page 536 of vol. viii.—C. E. de M. S.].

Besredka, who has done some of the best work available on the subject, states that anaphylactic shock may be largely averted by heating the serum to 56° C., or by giving normal serum per rectum before giving the subcutaneous dose, or, again, by giving a small subcutaneous dose before the larger dose. Vaughan, Jr. (Amer. Jour. Med Sci., Feb., 1913) states that a preliminary dose of as little as 0.1 or 0.2 c.c. (1½ to 3 minims) suffices, the therapeutic dose being given a couple of hours later if no untoward effects follow the test dose. This measure does not always protect. Thus Koch (Berl. klin. Woch., June 28, 1915) reported the sudden death of a child of 6, with scarlet fever and diphtheria, at once after injection of antistreptococcus serum, after a preliminary small injection. The child had been injected with diphtheria antitoxin the third and sixth days of his illness, and the intravenous antistreptococcus serum injection was given the twentieth day. Nothing could be found to explain the sudden fatality but anaphylactic shock, except that the child was debilitated, its resisting powers at a low ebb. In such cases serotherapy should be applied with special caution.

[We have seen under "tests" that even the *sub*cutaneous test doses may evoke grave symptoms, and even death. We can ascertain the susceptibility of the patient by the *intra*cutaneous test without exposing the patient.—C. E. de M. S.].

S. Wyard (Lancet, Jan. 20, 1917) states that by the injection of such a subminimal dose the individual is thereafter rendered refractory for a time, during which further and even larger doses may be safely given. In man sensitization rarely, if ever, reaches such intensity as to cause reaction with 1 c.c. (16 minims) of blood-serum, so that in the use of diphtheria or tetanus antitoxin, if it be considered unsafe to inject a large dose at once, 0.5 to 1.0 c.c. (8 to 16 minims) may be used as a preliminary injection, followed 5 or 6 hours later by any further dose that may be considered necessary. Should even greater rapidity be desirable, such a preliminary dose may be followed in 5 or 10 minutes by a larger, and every 5 minutes or so afterward by steadily increasing amounts, whereby in a very short time enormous doses may be given, and without risk of anaphylactic shock. In the case of *tetanus antitoxin* where prophylactic doses were given, these were practically all innocuous.

The amount of serum actually employed varies from 3 to 5 c.c. (48 to 81 minims), according to the concentration of the sample. An interval of anything up to 5 weeks between two such doses will never, according to the author, give rise to symptoms. About the sixth week, however, hypersensitiveness may appear. His remarks do not, of course, refer to those patients who have received previous massive injections—*e.g.*, for declared tetanus, or who require subsequent massive injections for therapeutic purposes.

It is probable that some horses provide serum which predisposes to a greater degree than that of other horses to anaphylaxis. In 1908 about 10 per cent. of cases occurring in Bokay's practice developed serum sickness, and in 1909 there was 23 per cent. In the month of January, 1911, out of 23 cases, 50 per cent. developed a serum exanthem. In all these patients the disease appeared as usual about 8 to 10 days after the injection. The serum used for these cases came from one lot derived from the same horse. Various authors have suggested, therefore, the use for the second dose, in such instance, of serum from another manufacturer, thus surely avoiding the same horse, while Ascoli, Wolff-Eisner and others have proposed for reactive cases the use of serum derived from cattle or sheep.

Friedberger and Mita (Deut. med. Woch., xxxviii, 204, 1912) found that when the serum was injected very slowly 18 to 60 minutes in sensitized guinea-pigs, as much as 10 times the fatal dose could be administered safely. Holobut (cited by W. W. C. Topley, Lancet, Feb. 3, 1917) found, on the other hand, that sensitization was more severely attained by repeated small doses than by a single large dose.

On the whole, we are brought back to Park's recommendation of the single large dose as the safest course.

Treatment of Anaphylactic Reaction.—The term "anaphylactic shock" is occasionally employed in this connection, but being misleading, since an approach to true shock is only witnessed when the patient is virtually moribund, *i.e.*, when his blood-pressure has fallen below normal, it should be abandoned.

Anderson and Schultz found some years ago (1910), using highly sensitive guinea-pigs, that **atropine sulphate, chloral hydrate, plus urethane and adrenalin, pure oxygen,** both alone or **with chloral hydrate and adrenalin,** almost invariably prolonged life, but that it did not prevent their eventual death from low blood-pressure, though not from acute asphyxia. Rosenau and Anderson tried, besides these agents, ether, recommended by Besredka, **paraldehyde** and **magnesium sulphate,** but concluded after exhaustive experiments that they had practically no influence on the outcome. Of these, **atropine, adrenalin,** intramuscularly or intravenously, **chloral hydrate, ether** and **pure oxygen inhalations,** and **artificial respiration,** might prove of service. A threatening case of anaphylaxis following the secondary use of cholera vaccine was successfully treated with **adrenalin** by Parhon and Bazgan (Bull. de la Soc. de Jassy, Jan.-Apr., 1916).

W. M. Crofton (Lancet, Jan. 20, 1917) found that 1 c.c. (16 minims) of **pituitrin** given at once relieves the collapse and spasm of the bronchioles within a few minutes. The dose is repeated if the symptoms show any signs of returning.

Edema of the larynx was evidently present in a case reported by M. B. Arnold (Lancet, Jan. 27, 1917), in which **tracheotomy** relieved all the respiratory phenomena and the cyanosis.

[The main features of the morbid process seem to me to have been overlooked, all efforts made so far having been purely impirical. That an intoxication prevails is undeniable. By enhancing the osmotic properties of the blood and its viscosity by means of **intravenous saline solution infusions,** preceded perhaps by **bleeding,** is the rational measure indicated. If the blood-pressure is low as it is late, *i.e.*, during the second stage, **adrenalin** should be added to the saline solution, drop by drop of the 1:1000 solution, being injected with a hypodermic syringe into the rubber tube of the irrigating instrument. Intramuscular injections of **pituitrin** may also be employed at this time to restore the vascular tension.—C. E. DE M. S.].

atropine in, ii. 453
alimentary, acute, **proctoclysis** in, viii. 197
Anaplasty, surgical, viii. 433
Anasarca, see Edema, ii. 190; also this Index.
Anastomosis after enterectomy, i. 70
  intestinal, i. 70
    Connell's method in, i. 70
    lateral, i. 71
    Maunsell's method in, i. 70
    Murphy button in, i. 71
    simple suture method in, i. 70
  nerve, viii. 260
    infiltration anesthesia in, iii. 499
  ureteroureteral, vi. 232
Anderson's dusting-powder, v. 509
Anemia, i. 646

Diagnosis, i. 657.—*Murmurs* are audible *inside the skull* in anemia from any cause and grow less and less audible as the blood-supply returns to normal, according to H. Köster (Zentralbl. f. innere Med., Nov. 15, 1913). In about 50 patients the murmurs were often distinct in hemorrhagic gastric ulcer or cancer, in pernicious anemia and with lesions localized in the skull. They were more pronounced with abnormally low hemoglobin content than with low corpuscle count.

The *anemic vomiting* in anemic girls is apt, according to Beddard (Pract., Mar., 1912), to be mistaken for gastric ulcer. The symptoms are pain in the epigastrium and vomiting excited by almost everything that is placed in the stomach. Its mucous membrane is so hyperesthetic that whatever touches it causes pain and vomiting. This is often associated with pain and tenderness of the skin and muscles under the left breast, though there is nothing the matter with these structures. Whereas in ulcer, solid food gives more pain than liquid, in anemic vomiting the pain and vomiting have not a constant relation to meals; they may have some of their worst attacks apart from food altogether. Sudden exertion, or being tired out, will bring on the same pain.

Cook and Meyer (Med. Rec., June 12, 1915) witnessed severe anemia in a young mulatto girl who also showed as a complication, *recurring, indolent, leg ulcers.* The red cells showed the greatest degree of variation both in size and shape, giving the appearance as if many of the cells had been broken into fragments. But the most frequent abnormal type was a much elongated, curled red cell, often sickle-shaped. There was also an eosinophilia of varying and sometimes intense degree. Two brothers and a sister, the other children in the family, were dead, and all suffered from severe anemia. Two similar cases had been found in the literature, both cases being mulatto with a chronic type of leg ulcer.

After tuberculosis, diphtheria and the eruptive diseases, *Leishman's anemia* or leishmaniosis is the most prevalent disease in southern Italy. G. Caronia (Archiv f. Kinderheilk, Bd. lix, Nu. 5-6, 1913) states that families living in rural districts or having much to do with domestic animals are specially subject to it. Direct contagion can be incriminated in most of the cases, the parasite probably being transmitted by means of bedbugs. There is also much to sustain the view that dogs and dog fleas are responsible for its transmission. Franchini has recently found the parasites in gnats.

Hemolytic anemia in children is characterized by hemolysis in the blood itself and failure of the bone marrow to produce new cells. H. Kleinschmidt (Jahrb. f. Kinderheilk., Jan., 1915) states that the red cell count is considerably decreased, but there are no special changes in the shape of the cells. One of its most striking features is the pronounced tendency to hemorrhages in the skin, mucous membranes and internal organs. There is a slight yellowish tinge to the skin, but not the straw yellow of pernicious anemia. Neither the blood-picture nor the clinical findings alone are pathognomonic of a blood-disease, but the combination of the two is.

School Children's.—Scaroni (Gaz. degli Osped. e delle Clin., Jan. 7, 1917) studied 42 cases of a form of anemia found in school children characterized by *eosinophilia.* Various parasites were always present in the feces. The degree of eosinophilia is uninfluenced by the kind of parasite present. He advises, therefore, that in all cases of anemia in school children the blood should be carefully examined for eosinophilia and the stools be searched for the ova of intestinal worms.

Aplastic anemia develops as hemorrhagic purpura which continues a steadily progressive course until the patient succumbs to the anemia in the course of a few weeks or months. In the case of a woman of 33 reported by E. Frank (Berl. klin. Woch., Sept. 13, 1915), the patient had contracted syphilis 14 years before but was apparently in perfect health when given an additional mild course of mercury and salvarsan. Eight days after its conclusion the hemorrhagic purpura developed and progressed to a fatal termination in 15 days. In this, as in all the cases on record, the small numbers or total absence of blood-platelets was a striking feature of the case.

Etiology, i. 646.—The so-called tropical anemia is almost always the result of several causes combined, such as malaria, uncinariasis, and semistarvation, according to Bates (Jour. Amer. Med. Assoc., Jan. 27, 1912). The splenic enlargement is primarily due to malarial infection, and the ultimate changes in the spleen are probably influenced by various intercurrent infections.

The accepted idea of blood-destruction rests on a hemolytic action of the spleen. Quincke, however, held that there was a gradual deterioration of cells in the circulation. In dogs and rabbits, phagocytosis accounts for blood-destruction, but some other mechanism must be sought for in cats, monkeys, and man. Rous and Robertson (Assoc. Amer. Phys.; N. Y. Med. Jour., Jan. 13, 1917), as a result of experiments, conclude that phagocytosis is not sufficient to account for blood-destruction in man, and that there is a gradual disintegration of red blood-cells, with removal in the liver. S. J. Meltzer recalled the observations of Lamson and Adler that when there is an accumulation of cells in the liver, the use of adrenalin caused the stored cells to be driven out.

[An important feature is generally overlooked, viz., that hemolysis occurs whenever toxics, endogenous or exogenous, appear in the blood in quantities sufficient to evoke a marked defensive reaction. The antibodies then attack not only the pathogenic toxics but the erythrocytes as well.—C. E. de M. S.]

Experiments were conducted by Krotkoff (Roussky Vratch, Jan. 18, 1914) showing that vitiated air can cause anemia in human beings only when there is some predisposition of a toxic order to influence the blood-making organs to disease. Otherwise the bad air of prisons, workshops, etc., causes only pseudo-anemia, that is, pallor of the integument, but with no changes in the blood.

Pathology, i. 649.—The experimental research and clinical experience on hemolytic affections by G. Banti (Semaine méd., July 2, 1913) showed that the agents of hemolysis can be divided into two great classes: 1. On the red corpuscles, such as distilled water. 2. Those which act directly on the reds but have also the power of stimulating the hemolytic organs to an excessive destruction of blood-corpuscles, such as serums, phenylhydrazin, etc. These act through the spleen, and to a far less extent, the liver, the lymph-nodes and the bone marrow. In clinical hemolytic splenomegaly four factors are at work: the agent causing hemolysis; the excessive hyperactivity in hemolysis of the spleen; the resulting anemia and the (occasional) jaundice—also the consequence of the excessive hemolysis.

Predtechensky (Russky Vratch, xv, No. 14, 1916) insists on the existence of primary aplastic anemia caused by congenital hypoplasia of the bone marrow. This form, due to defective development of the bone marrow may be fatal. It is usually combined with hypoplasia of the viscera. Frequently the congenital hypoplasia of the bone marrow is associated with hemorrhages, and this may result in various types of anemia.

Cropper and Drew (Jour. Trop. Med. and Hyg., xix, 20, 1916) report the presence of minute scarlet dots or granules with a bluish body resembling "Seidelin bodies," and indistinguishable from them, in the red cells of the blood of pernicious anemia, of the human fetus, of new-born kittens, and rarely in that of children suffering ordinary anemia. They are inclined to believe that these bodies are products of the degeneration of the nuclei of erythroblasts.

Treatment, i. 659.—In children less than 1 year of age, anemia may be caused by poor milk, excessive feeding, or less frequently insufficient feeding; in those older than 1 year a similar condition may result from an unduly prolonged milk diet, weaning too suddenly, or from food not suitable for young children. In children over 1 year, **barley, lentil,** or other similar **porridges,** or **yolk of egg**—all articles rich in iron—may be given, though due trial and selection will have to be made, the same articles not being suitable for all cases. In children 14 to 16 months old, **raw meat** may be given, especially if there have been manifestations of subacute enteritis with diarrhea. During 15 to 20 days in each month, from 20 to 40 Gm. (5 to 10 drams) of the meat may be given, frequently with a little **dilute hydrochloric acid** in the form of lemonade and a small amount of **pepsin.** M. Maillet (Presse méd., July 11, 1914), holds that only when the gastrointestinal condition has improved should iron medication be taken up in these cases.

adrenalin chloride in, i. 663
aloes in, i. 663
aloin in, i. 662
antimony in, ii. 27
arsacetin in, i. 661
arsenic in, i. 659, 660, 661, 662

Arsenic induces the production of new red blood-corpuscles, while **iron** promotes that of hemoglobin and favors its being taken up by the corpuscles, according to C. Aubertin (Presse Méd., May 20, 1914). In some cases arsenic alone or iron alone may restore the blood to normal, but as a rule both are needed.

Hirschfeld (Med. Klinik, Jan. 11, 1914) holds, moreover, that **arsenic** is useful when the number of blood-corpuscles is much below normal, and there is little response to iron. Small amounts of **alcohol** have a stimulating action on some anemic patients, while others are unable to stand it.

Anemia (*continued*).
atoxyl in, i. 661; ii. 261
B-naphthol in, i. 662
belladonna in, i. 662
bismuth in, i. 662
bismuth salicylate in, i. 662
bitter tonics in, i. 662
blood-pressure in, ii. 498
blood transfusion in, viii. 805

Curtis and David (Surg., Gynec., Obstet., Oct., 1912) urge that **blood transfusion** is the treatment of choice in severe acute anemia. The transfused blood is capable of resuscitating from otherwise fatal hemorrhages, and physiologically replaces the blood which has been lost.

bone-marrow in, i. 793
calcium lactate in, i. 660
Carlsbad salts in, i. 662
cascara sagrada in, i. 662
charcoal in, i. 662
claret in, i. 662
climatic treatment in, vi. 716
cold douches in, viii. 811
colonic irrigations in, i. 661
copper sulphate in, iii. 645
correct **hygiene** in, i. 659
defibrinated blood injections in, i. 662, 663

Intramuscular injection of blood was resorted to by Esch (Wiener klin. Woch., Jan. 16, 1913) in 6 cases, and the results are stated to have been "remarkably favorable." All the patients had lost large amounts of blood, and the reds had dropped to less than 2 millions in most. Intramuscular injection of **defibrinated human blood** was found free from all danger. No untoward by-effects were noted in any instance. It is very important to ascertain that the needle has not entered a vein. The harmlessness of the method, its simplicity and painlessness, render it superior to intravenous transfusion of blood, which is neither simple nor harmless.

Experiments and clinical experience in 25 cases in which transfusion of small amounts—5 c.c. (1¼ drams)—of **defibrinated human blood** applied 46 times, have shown Weber

(Münch. med. Woch., June 17, 1913) its value, and confirmed the advantages of keeping the blood on ice for from 6 to 24 hours after it is drawn and defibrinated. This does away with all tendency to a reaction, either subjective or objective. Only 6 times was there any evidence of a reaction and it was never of a threatening character. This recommendation applies only to the small doses advocated—never over 5 c.c. Larger doses are liable to be followed by a severe reaction, chills, fever, etc.

diastase in, i. 662
diet in, i. 663

Burgi (Corres.-Blatt f. Schweizer Aerzte, Apr. 16, 1916) holds that the green coloring matter of vegetables is not only the most powerful regenerator of the blood, but a valuable stomachic and regulator of assimilation. Maillart (Corres.-Blat f. Schweizer Aerzte, June 3, 1916) likewise advises the daily use of **green vegetables,** not only for the anemic and dyspeptic, but for the healthy as well. Chlorophyll has been given as such to the anemic, but doubtless cannot replace the fresh vegetables.

Olive oil and glycerin, equal parts, in gradually increasing doses 2 hours after each meal is a valuable measure, according to Bram (Med. Rev. of Rev., Sept., 1912).

digitalis in, iv. 158
ferratin in, i. 660
Fowler's solution in, i. 661
fresh air in, i. 664
gentle exercise in, i. 664

In the anemia of rheumatic patients, sensitiveness to cold, and local tenderness often remain for some weeks after an attack of acute articular rheumatism, and are present in chronic rheumatism. Diminished heat production and impaired vasomotor regulation are important features of these conditions. Dausset (Paris Médical, Oct. 18, 1913) advises **hot air** to the lower half of the body, **electric light baths, baths in hot water gradually cooled,** or **diathermy,** to make up for caloric deficiencies, re-educate vasomotor control, and also to promote elimination of toxins by means of the sweating induced.

hydrochloric acid in, i. 662
hydrotherapy in, i. 663
hypophosphites in, i. 662
inorganic iron in, i. 660, 661
intestinal irrigation in, i. 662
iron in, i. 659, 660, 662; vi. 76, 83-85, 473, 573
iron arsenate in, i. 660

In the anemias of malaria and those resulting from gastro-intestinal disturbances, Robbie (So. Med. Jour., July, 1914) gives 5 or 6 grains (0.3 to 0.4 Gm.) of **iron citrate,** 1 to 6 grains (0.065 to 0.4 Gm.) **sodium arsenate** and 1/120 grain (0.0005 Gm.) **strychnine sulphate** put up in small sterile ampoules. The contents of one ampoule is given hypodermically or intramuscularly once or twice daily.

In secondary anemia the intramuscular injection of iron and arsenic in organic compounds is entirely practical in office and dispensary work. It does away with the annoying complications that frequently result from the administration of the drugs by mouth. Musser (Boston Med. and Surg. Jour., May 23, 1912) used a combination of **iron** and **arsenic** of each 0.06 Gm. (1 grain), and **sodium glycerophosphate** 0.1 Gm. (1½ grains) dissolved in 1 c.c. (16 minims) of distilled water. The solution is placed in small glass ampoules, sterilized, and is ready for instant injection. It is free from irritating qualities and may be injected into the muscles of the thigh or into the deltoid muscle. The injections were given, as a rule, twice a week, though in some cases as often as 1 a day was given for a short time, but in several cases only once a week.

H. Lowenburg (Amer. Jour. Dis. of Children, Sept., 1912) recommends for intramuscular injections in severe cases of anemia in children the following preparation:—

℞ *Ferri citratis* . gr. 3/10 (0.018 Gm.).
Sodii cacodylatis,
Sodii glycerophosphatis
āā .... gr. ½ (0.03 Gm.).
Aquæ destillatæ sterilisatæ ...... ♏xx (1.25 Gm.).
M. ft. solutio.

Weekly or bi-weekly injections should be given. The needle is thrust deeply into the muscles on the posterior and outer aspect of the arm, and its direction at right angles to the skin surface. A slight stinging sensation should alone result. A rapid increase in the hemoglobin and erythrocyte count results.

iron carbonate in, i. 660
iron citrate in, i. 661

A chlorotic type of anemia is observed in infants, according to M. de Biehler (Arch. de Méd. des Enf., Mar., 1913), in which there are pallor, digestive, circulatory, and nervous symptoms and a marked loss of hemoglobin, with a normal number of red cells. The internal organs are normal; there are anemic murmurs in the heart and vessels of the neck. The child is apathetic, quiet, has enlarged glands and sleeps poorly. This condition results when only milk is used, or when it is continued too long. The treatment is improved **diet** is used and **iron** is administered in large doses.

iron citrate (green ammoniated) in, i. 662
iron (inorganic) in, i. 660, 661

Series of chlorotic infectious, and posthemorrhagic anemia treated with **colloidal iron** containing 1 part of the metal in 1000 of fluid. The preparation was injected subcutaneously, intramuscularly, or intravenously in doses of 2 to 5 c.c. (32 to 80 minims). A rapid rise in the hemoglobin percentage and red cell count was noted, but without any evidence of the unpleasant effects of iron sometimes witnessed. Duhamel (Revue de Thérap. Médico-Chir., Mar., 15, 1914).

iron peptomanganate in, i. 660

Poisoning from illuminating gas or defective stoves is the cause of the anemia in many newborn infants, in the opinion of Delille (Revue Mens. de Gynéc., d'Obstet., et de Péd., Feb., 1913). To counteract this, the writer gave iron systematically to the mothers during the pregnancy, two courses of **protoxalate of iron** in daily doses of 0.2 Gm. (3 grains), each course lasting 3 weeks. In the 5 cases reported in detail the effects were excellent, none of the children showing signs of anemia, when all the children previously born in the family had been markedly anemic.

iron subcarbonate in, i. 663
iron valerianate in, i. 662
iron waters in, vi. 712
lactic acid bacillus in, i. 662
laxatives in, i. 663
light therapy in, vi. 359
lysol in, i. 662
magnesium sulphate in, vi. 473
manganese in, vi. 573
massage in, i. 663
neutralon in, i. 663
nutritious food in, i. 659
nux vomica in, i. 660
out-of-door life in, i. 659

In a study of the **open air treatment** of anemia in children, R. C. Freeman (Boston Med. and Surg. Jour., Sept 9, 1915) noted that the best results, compared with controls in the ward, occurred in cold weather. No increase of blood-pressure was noted; the most marked phenomena were increased color in cheeks, diminished cough, better sleep. There was reduced spread of contagion, there having been cases of measles on the roof without spread.

The physical depression and weakness of the muscles entailed by the anemia are felt particularly in the muscles involved in respiration according to Sippell (Therap. der Gegenwart, Mar., 1913). The inadequate ventilation of the lung increases the tendency to anemia, and

the lungs suffer directly from the lack of normal expansion. In examining these cases it is important to investigate the breathing capacity and to institute deep breathing exercises.

In females, Bandler (Archives of Diag., Jan., 1913) recommends the joint use of ovarian extract, iron, and arsenic in anemias, including chlorosis.

oxygen inhalations in, vii. 274
ozonized air in, vii. 278
pancreatin in, i. 662
pawpaw in, i. 662
pepsin in, i. 662
phenol in, i. 662
phenolphthalein in, i. 662
phosphoric acid in, vii. 449
phosphorus in, i. 660; vii. 455
potassium bitartrate in, vi. 473
priessnitz half-bath in, viii. 809
pyramidon in, vii. 719
quinine valerate in, i. 662
rain douches in, viii. 811
rapid rhythmic pressure on the chest in, i. 663
rhamnus purshiana in, vii. 822
rhubarb in, i. 663
saline solution, i. 663
salol in, i. 662

Very small doses of salvarsan—0.05 or 0.075 Gm. (¾ to 1⅙ grain)—is a simple and harmless method of giving arsenic. Kall (Münch. mod. Woch., July 7, 1914). It was extremely effectual in 50 cases, increasing the weight, improving the blood-picture and subjective symptoms in all forms of secondary anemia and mild tuberculosis. From 10 to 15 injections were given, the course being repeated after an interval of a few weeks.

sleep in, i. 659
sodium arsenate in, i. 662
sodium cacodylate in, ii. 701, 703, 705, 706
spleen extract in, i. 795
stout in, i. 662
strontium bromide in, i. 662
strophanthus in, viii. 412
strychnine in, i. 660; vii. 147
sunshine in, i. 664
thiocol in, viii. 528

Anemia (*continued*).
transfusion, direct, in, i. 661
transfusion of homologous blood in, i. 663
Turkish bath in, viii. 813

The X-rays in large doses destroy the bone marrow, but in small doses enhance its activity. This explains their beneficial effects in severe anemia observed by Vaquez and Aubertin (Arch. des mal. du Coeur, Sept., 1915) with very mild exposures, the rays being filtered through 2 or 4 mm. of aluminum.

zinc valerate in, i. 662
ascites of, vii. 368
cardiac, iron in, vi. 87
cerebral, amyl-nitrite in, vii. 56
chlorotic, nitroglycerin in, vii. 55
due to lead, iron protiodide in, vi. 85
hemorrhagic, iron in, vi. 84, 85
infantile or von Jaksch's, blood-picture in, v. 382
infectious, i. 647
iron tartrate in, vi. 85
of nursing women, hypophosphites in, vii. 450
lactophosphites in, vii. 450
of scarlet fever, hot wet pack in, viii. 813
pelvic, yohimbin in, viii. 833
Anemia, pernicious progressive, i. 625

Diagnosis, i. 636.—The familiar fact that this chronic disease ends in death in practically every case has rightly been attributed to the tardiness with which its true identity is recognized. So advanced have the lesions then become that remedial measures are of no avail. Efforts have been made, therefore, to discover initial symptoms. Schaumann (Deut. med. Woch., June 27, 1912) emphasizes the importance of a sign first pointed out by William Hunter: *soreness of the tongue and mouth,* and in some cases of the *throat,* the organ remaining moist and uncoated, though *deeply grooved.* These signs appear before the blood gives any positive indication of the nature of the disease. Zabel (Klin-therap. Woch, Jan. 6, 1913), who describes the lingual pain as *burning,* states that he has witnessed it in the sim-

pler secondary anemias, but that it disappears in these disorders when the general condition improves. H. Stern (Deut. med. Woch., July 23, 1914) considers it the most reliable of the inaugural symptoms of true pernicious anemia.

In 4 cases of the classic type, Roccavilla (Policlinico, Sept., Med. Sec., 1916) noted *burning heat* and *dryness of the lips, tongue* and *throat* as the first sign of trouble. The complexion assumed a lemon yellow tint with greenish reflections in all but one of the patients.

An authoritative clinician, Friedenwald (Boston Med. and Surg. Journal, Aug. 1, 1912) noted that in a series of 58 cases all showed *gastro-intestinal symptoms.* There were loss of appetite, nausea, vomiting, indigestion (fullness, pressure, distention), diarrhea and constipation. Achylia gastrica was present in about 70 per cent. of the cases and even in the stage of apparent recovery the gastric secretion did not return.

[A predominant fallacy of present methods—one which entails a sacrifice of human lives in many directions—is the prevailing tendency to await the development of all classical symptoms and laboratory proofs of a disease before starting to oppose it with any degree of vigor. Our aim should be to discern the **trend** of the phenomena witnessed, and then to resort to measures which, though harmless in other disorders, might prove curative in the suspected malady. No disease better than pernicious anemia illustrates this fact. Every one knows the value of arsenic in this disease; even in advanced cases it will often cause a remission quite surprising, both in degree of improvement and duration. But it is likewise useful in secondary anemias other than those of clearly determined causes, such as those due to hemorrhage, lead, intestinal parasites, etc. By elimination, therefore, we can easily determine the "arsenic group," if I may so call it, and use this drug, tentatively at least, along with other measures indicated, and referred to below. Given, however, a case in which *yellowish pallor* and *lassitude* are attended with *oro-gastro-intestinal phenomena* with *remission* and *periodical gastralgia,* a tentative diagnosis of the form of pernicious anemia most frequently encountered is warranted, even before the blood affords any clue to the identity of the disease. C. E. DE M. S.]

Another feature in the early diagnosis of pernicious anemia worthy of closer observation in the future is the occasional early predominance of nervous phenomena. Thus, in several cases seen by C. E. Riggs (New York Med. Jour., July 15, 1913) *mental symptoms* recalling those of dementia paralytica and *spinal symptoms* resembling those of ataxic paraplegia had long preceded any of the blood characteristics. Wilson (Jour. Amer. Med. Assoc., Sept. 7, 1912) holds that if the spinal involvement, which, in a case of his own consisted of degenerative vacuolization of the nerve-cells and replacement gliosis, were borne in mind, many cases that fail to be promptly recognized would clear up at once. The history of his case and the microscopic findings suggested the intestinal origin of both the pernicious anemia and the spinal disorder.

General Symptomatology, i. 625.—The observations of O. Moritz (St. Petersburg Med. Zeit., March 15, 1914) indicate that in the elderly, pernicious anemia due to intestinal parasites may suggest heart disease. In 7 personal cases the bothriocephalus was responsible and 1 patient died before the helminths could be expelled; 22 heads were found in his bowel. All in this group had *fever* and *systolic murmurs,* but the *retinal hemorrhages* pointed to the presence of pernicious anemia, which diagnosis proved to be correct on examination of the blood.

The presence of grave pernicious anemia is to be suspected, according to L. Bard (Semaine méd., Mar. 25, 1914) when *pulsation of the inferior vena cava* is discernible. It is best recognized by simple inspection, especially in the median line below the umbilicus, somewhat more to the left than to the right, and is visible as a double, undulatory rise of the surface in each cardiac cycle. Palpation is negative, and the pulsations disappear when the patient rises from the recumbent to the sitting or standing posture.

To what he deems the only blood-signs that are not found in secondary anemia, high color index and deeper pigmentation of the erythrocytes, Duenner (Berl. klin. Woch., Nov. 2, 1914) adds the presence of *hemoglobin-rich megalocytes.* He attaches great importance to this sign in the diagnosis of pernicious anemia.

Prognosis, i. 639.—It is generally believed that pernicious anemia is always fatal. This, fortunately, does not apply to all forms. Recovery occurs in puerperal cases, whether the disease appear during pregnancy or the puerperum, when arsenic is administered and evacuation of the uterus, spontaneous or induced, occurs. Nägeli, according to Schuepbach (Correspondenzbl. f. Schweizer Aerzte, Bd. xliii, nu. 45-47, 1913) has reported complete recovery for 11 years to date in 2 cases and for 5 years in another case. Two of his patients bore other children later with no return of the anemia. The mortality is high among the children simply because anemia brings on premature delivery. Wolff (Deut. med. Woch., Mar. 26, 1914) contributes an interesting confirmatory case in a primipara, of 22 years, in whom the blood-picture was typical. As a result of a spontaneous miscarriage she was immediately relieved of all her symptoms. The child was prematurely born, asphyxiated, and died after 1½ hours. The patient remained entirely free from symptoms.

Etiology, i. 638.—Contrary to the prevailing belief and the assertions of Ehrlich and Lazarus, pernicious anemia may be a family disease. Thus, C. J. Bartlett (Jour. Amer. Med. Assoc., Jan. 18, 1913) observed 5 instances in one family, the father, mother, and 3 sons. We might recall in this connection the series of cases reported some time ago by Patek (Jour. Amer. Med. Assoc., Mar. 6, 1911), which all occurred in the same family—all fatal—in 2 brothers, 1 sister, a paternal cousin and a paternal uncle. Blood examinations made in all established the diagnoses beyond a doubt. Other instances of this sort have been reported. The importance of recognizing this etiological feature lies in the fact that it adds the diathetic disorders to the list of possible poisons to which the main pathogenic factor, hemolysis, is attributed.

Pathogenesis and Pathology, i. 630.—The trend of analytical observation in this connection has been toward ascertaining whether the clinical phenomena due to the lesions of the various organs may also be traced to the influence of a poison as is now, and on the basis of sound data, generally believed. Kabanoff (Roussky Vratch, Sept. 7, 1913) studied the problem with the aid of the Abderhalden reaction and reached the conclusion that there exists a definite causal relation between pernicious anemia and gastrointestinal disturbances. This suggests that autointoxication of gastrointestinal origin is an important pathogenic factor in the process. Whether this be the primary causal agent in his cases or not, G. H. Williams (Jour. Amer. Med. Assoc., Sept. 12, 1914) refers to 2 patients suffering from pernicious anemia in which insanity appeared in a form difficult to classify otherwise than among the intoxication psychoses. In both there was lack of orientation; in one in every field, especially in regard to place; lack of insight; persecutory delusions; memory in one case impaired and in the other normal, while in the other there was a lack of accuracy in recent and remote events; some degree of euphoria; lack of attention and appreciation and numerous physical signs, such as paresthesia, partial anesthesia, vertigo, speech disturbance, arm and leg paresis, ankle-clonus, unequal patellar reflexes, Romberg signs and unsteady gait. As independent confirmatory testimony in favor of this view, Pfeiffer (Jour. of Nerv. and Mental Dis., Feb., 1915) calls attention to the fact that the morbid changes in the cortical neurons of cases of pernicious anemia that show psychic phenomena, are similar to those found in the psychoses of toxemic origin.

H. A. Christian (Arch. of Internal Med., Oct., 1916), after a study of 14 cases, concludes that in a severe case the *renal function* is *disturbed* much as it is in advanced chronic nephritis. The disorder of excretion seems to be either a nutritional or a toxic disturbance in renal cellular activity. There is no other evidence of chronic nephritis in these cases, and the disturbance decreases with improvement in the anemia, unless the latter has been permanently disturbed.

Blankenhorn (Arch. of Internal Med., Mar., 1917) concludes after studying 20 cases, that bile pigment is frequently found in the blood in pernicious anemia, and is the cause of the jaundice. The bile pigment is in some way fixed to the plasma, and therefore does not appear in the urine. The presence of bile pigment in the blood is not always betrayed by jaundice. Bile salts are frequently found in the blood, alone or associated with bile pigment.

[I have pointed out that bilirubin corresponds in its chemical properties with the adrenal principle. Hence its presence in the blood. C. E. DE M. S.]

Prophylaxis.—This phase of the problem is fortunately beginning to attract attention. A careful study of each case should aim to **ascertain the underlying source of the toxic** to which the prevailing hemolysis is due, and to prevent its formation. W. H. Wilcox (Pract., Sept., 1913) attaches considerable importance to oral sepsis, particularly to that form now known to underlie various disorders of toxemic origin, pyorrhea alveolaris. He, therefore, recommends the following mouth-wash:—

℞ *Liquoris hydrogenii*
dioxidi .... ʒij (8 Gm.).
Glyceriti phenolis . ♏xx (1.25 Gm.).
Aquæ ....q. s. ad ℥j (30 Gm.).
Misce.

Carious teeth should be removed, and, if there is pyorrhea alveolaris, the affected teeth taken out; if the patient's condition does not permit, local antiseptic treatment, together with an **autogenous vaccine**, may be tried.

In the article on RIGGS'S DISEASE, pyorrhea alveolaris, in the eighth volume, page 33, and in the present index-supplement, will be found other efficient methods for the prevention of toxemia due to this cause.

Treatment, i. 641.—L. F. Barker and T. P. Sprunt (Trans. Amer. Med. Assoc.; N. Y. Med. Jour., June 9, 1917) recommend removal of all ascertainable foci of infection, an abundant **roborant diet, arsenical** treatment, the administration of **hydrochloric acid** immediately after meals, and of **pancreatin** and **calcium carbonate** 3 hours after each meal. Splenectomy and transfusions of blood were not found necessary. Several of the patients thus treated have remained well over a long period.

antistreptococcic serum in, i. 644
appendicostomy in, i. 645

Percy (Surg., Gynec. and Obstet., May, 1917) reported 24 cases in which **operations to eliminate pathogenic foci** had been resorted to. The regions in which the foci were found were the gall-bladder, the appendix, and the mouth and throat. Of the 24 cases, 14, or 58 per cent., were all clinically in good condition after intervals since operation varying from about 7 to 32 months. This latter case is perfectly well and carries no evidence of pernicious anemia in her blood, except an occasional normoblast. In all cases except one in which the disease has recurred, the patient presented mental, nervous or spinal cord symptoms when they came under treatment, and in most of them these symptoms occurred early in the disease. It would seem that in all cases with involvement of the spinal cord and central nervous system, the prognosis is extremely bad under any form of treatment. Such patients should not be submitted to operation.

arsacetin in, ii. 263

arsenic in, i. 641, 642, 643, 644, 645; ii. 139

This drug and the preparations containing it continue to hold the first place among therapeutic agents capable of at all influencing the disease favorably. It is becoming apparent, however, that simultaneous treatment of the gastrointestinal canal is helpful. Brieger (Deut. med. Woch., Nov. 14, 1912) cites 3 cases in which he gave **Fowler's solution** in the usual dosage after meals, **and pancreatin** before the meals. The rapidity of the improvement was remarkable, though neither agent alone had proved effectual. Of the 3 patients 2 died later after they had voluntarily given up treatment; the third has been under supervision for 3 years. In the latter case treatment is faithfully resumed whenever the blood findings show recurrence of alarming symptoms.

[These observations sustain indirectly a feature of the problem I have urged many years, viz., that a pancreatic ferment, trypsic in type, is the main *active* agent, through its proteolytic activity, in the defensive functions of the body. This view, in so far as the rôle of digestive ferments is concerned, has been sustained since by the experimental work of Abderhalden. If, therefore, we administer **pancreatin** in pernicious anemia, we enhance the proteolytic and antitoxic activity of the intestinal digestive process, and thus check more or less efficiently the formation of poisons to which the disease is due. The same end is attained, from my viewpoint, by the use of **hydrochloric acid**, which, as shown below, is also effective in pernicious anemia. By promoting, on reaching the duodenum, the formation of enterokinase, it likewise enhances the proteolytic and antitoxic activity of the intestinal digestion by converting trypsinogen into trypsin. **Trypsin** thus suggests itself as another efficient agent in the treatment of the disease, care being taken to administer it with an alkaline salt, **sodium carbonate**, for instance. By administering either pancreatin or trypsin **in stearic acid-covered capsules** the destructive action of the gastric-juice upon them may be avoided. C. E. de M. S.]

betanaphthol in, i. 644

blood-picture in, v. 382

blood, defibrinated, in, i. 644

blood, transfusion of, in, i. 642, 643

A. Archibald (St. Paul Med. Jour., Feb., 1917) reports 26 cases treated by **transfusion** at the Mayo Clinic. Forty-six transfusions were performed in the series, a single transfusion proving sufficient in only 11 patients. Sixty-nine per cent. of the entire series received marked immediate benefit from the procedure. Among 14 unfavorable cases deemed unsuitable for splenectomy similar improvement was noted in 50 per cent. Up to the sixth decade, the age of the patient had no bearing on the results; of 5 patients between 60 and 70 but 1 showed definite improvement. Patients with a history of remissions, even though ill for several years, seemed most benefited by transfusion. Those without remissions often failed to respond. Recent, acute cases were usually little influenced. Results following transfusion from relatives were not superior to those in the cases of unrelated donors. But 1 patient had a severe reaction; mild fever and a severe chill lasting 40 minutes followed transfusions from the wife and from a friend; no benefit resulted. Eleven patients had mild fever for a day or 2. Such reactions did not prove necessarily indicative of benefit from the procedure. General improvement usually paralleled that in the hemoglobin. Distressing numbness, burning, and tingling of the hands and feet were relieved by the treatment. When no benefit follows a transfusion, a different donor should be tried.

O. Leyton (Pract., Mar., 1917) considers that, at present, massive **transfusions** of blood offer the greatest chance of improvement to sufferers from pernicious anemia, but any error in the technique may be followed by a fatal result. The procedure is one which should be attempted only by those who have had considerable experience in intravenous injections and are well acquainted with the physiological teachings about clotting of blood. Even with perfectly matched bloods reactions may occur, but they may be prevented by the administration half an hour before the injection of 1/150 grain (0.0004 Gm.) of **hyoscine methyl bromide** along with 1/6 grain 0.01 Gm.) of **morphine.**

bone-marrow in, i. 642, 793
cholesterin in, i. 645

When cases prove refractory to arsenic, M. Roch (N. Y. Med. Jour., Mar. 8, 1913) found cholesterin efficient in daily doses of 1 to 2 Gm. (15 to 30 grains) administered in cachets or oily solution.

diet in, i. 641, 642
glycerin in, i. 646
gymnastic exercises in, i. 641
hydrochloric acid in, i. 641, 642; v. 555

Croftan, of Chicago, found that 15 drops of the strong hydrochloric acid after each meal procured notable improvement in 14 cases, the symptoms of pernicious anemia disappearing while those of achylia persisted. J. A. Sealy (Lancet-Clinic, Feb. 15, 1913) recommends Croftan's treatment in all cases showing reduced gastric acidity. He gives 10 to 15 drops of the acid in mucilage water a few minutes after each meal, the dose being repeated in 30 minutes. The mucilage water, which is employed to prevent injury to the gastric mucosa by the acid, consists of 1 ounce (30 Gm.) of pulverized acacia to 1 quart (1000 c.c.) of water. One-half glassful of the mucilage water is used to each dose of acid. He deems it important to regulate carefully the dose, for if too little is given the patient will not reap the benefit of the treatment, while if too much is given he will not retain the remedy.

intestinal antiseptics in, i. 641, 644
intestinal irrigation in, i. 641, 642, 644
iron in, vi. 83
lavage of the stomach in, i. 641
massage in, i. 641
mercury bichloride injections in, vi. 679
nuclein in, vii. 109
olive oil in, vii. 171
oxygen inhalations in, i. 641; vii. 274
pepsin in, i. 642
phosphorus in, vii. 455
quinine in, i. 641
raw meat in, i. 642
rest in bed in, i. 641
saline enemata in, i. 644
saline laxatives in, i. 641
saline solution in, i. 644
salol in, i. 644
salvarsan in, iv. 226

The use of salvarsan in the treatment of pernicious anemia is full of promise. Authors seem, however, to expect syphilis as a cause in a given case when it proves effective. Indeed, a positive Wassermann was obtained by W. Egbert Robertson (N. Y. Med. Jour., July 4, 1914) in a case of pernicious anemia with achylia gastrica refractory to Fowler's solution which recovered symptomatically under a single intravenous injection of salvarsan. The patient gained 30 pounds in weight with a return of the blood-picture to normal, but the positive Wassermann remained in the serum and negative in the spinal fluid. It is not, therefore, as an antiluetic that salvarsan acts. This is well shown by the fact that Boggs (Bull. Johns Hopkins Hosp., xxiv, 322, 1913), referring to 1 of several cases in which salvarsan proved effective, states that he had no history of syphilis, and gave a negative Wassermann in the serum and spinal fluid before the salvarsan was given. And yet this patient, who was in his fifth relapse, quite unresponsive to Fowler's solution and only showed a very slight improvement after four months of sodium cacodylate injections, showed after the intravenous administration of salvarsan, in doses of 0.3 Gm. (5 grains), every 4 weeks, a steady rise in the blood-count. The red cells, in 16 weeks, rose from 500,000 to 5,000,000, the hemoglobin from 23 per cent. to 90 per cent., and the patient's general condition was much improved. It is evident that it is as a powerful arsenical preparation, *i.e.*, as arsenobenzol, that salvarsan acts, and that as such it should command even greater confidence than in the past.

Lampe (Med. Klinik, Nov. 19, 1916) refers to the conflicting views regarding the value of **salvarsan** given intravenously in pernicious anemia and records his own experiences in 3 very severe cases. In all of them the administration of small doses of salvarsan was followed by restoration of the blood-picture almost to normal, but 2 of the cases recurred later, 1 with a fatal outcome.

It becomes a question whether **neosalvarsan** might not be preferable to salvarsan in these cases, and whether either is preferable to arsenic. Bramwell (Brit. Med. Jour., Mar. 6, 1915) used small doses of salvarsan and neosalvarsan intramuscularly in 21 cases. The benefit was more prompt and the duration of the improvement generally longer than when arsenic was given by the mouth. There also seemed to be a larger proportion of apparent cures. There was usually slight local disturbance and some fever. Morphine was occasionally necessary when the pain was very troublesome. **Salvarsan seemed more effective than neosalvarsan**, but the latter caused less local reaction.

serum therapy in, i. 644
sodium cacodylate in, ii. 703, 704, 705
spleen extract in, i. 795

Operative treatment of pernicious anemia was recently introduced by Eppinger, of Vienna, **splenectomy** having first been performed by this surgeon in 1913 on the sound plea that the red cells were chiefly destroyed in the spleen. As Thayer, of Johns Hopkins, stated at the last meeting of the American Medical Association (N. Y. Med. Jour., June 24, 1916), however, it seems a serious matter to expose the patient to the extra danger of so severe an operation, when, as is well known, some patients may live years without operative intervention.

[Especially is this warning timely in view of the indications formulated by D. C. Balfour (N. Y. Med. Jour., June 24, 1916) which, if I am not mistaken, are those that prevail at the Mayo clinic—the original article having not, as yet, been published. The indications given for the operation are (1) in patients with definitely enlarged spleen; (2) in those who show marked icteroid discoloration; (3) when the disease has lasted only a short time. These may tend to insure an operative success, but not the sufferer's recovery. Conversely, we now know that (1) when the origin of the toxemia can be determined, the splenic enlargement will sometimes disappear; (2) that many patients live years with a marked icteroid discoloration—5 years in one of my cases; and (3) that recent cases are those most amenable to medical treatment. In view of these facts, of the recent contributions to the therapeutics of the disease, and the data submitted below, **splenectomy is indicated only** after medical treatment has been conscientiously tried, or, in other words, as a **last resort.** C. E. de M. S.]

Turk probably summarizes definitely the actual status of the operation when he states (Deut. med. Woch., Feb. 19, 1914) that it induces a marked change for the better, but that the blood does not return to the normal type. The patients are much improved, but in none of his 7 cases observed during the previous ten months had the blood-picture returned to normal. A remarkably rapid and thorough-going remission may almost be counted on in apparently almost moribund patients; it acts more rapidly than arsenic, but it does not seem to remove the cause of the pernicious anemia. The morbid spleen functioniong he rightly considers as but one link in the chain of factors causing the disease. H. C. Moffit (Med. Record, June 6, 1914) states that while surprising improvement with marked blood regeneration had occurred in many of the 31 cases reported, including 1 of his own, death resulted immediately or soon after the operation in 8 instances, while a number of the patients had not been improved. A valuable and comprehensive study of the literature by E. D. Krumbhaar (New York Med. Jour., June 24, 1916) gave the late results of the operation in 153 cases. Of these, 30 were fatal within 6 weeks, a mortality of 20 per cent.; more recent operations showed a mortality as low as 6 per cent. Of the remaining, two-thirds showed distinct improvement; 23 cases showed no improvement, and several actual harm. In 24 of the cases traced for one year, 11 remained improved, 6 relapsed, and 7 ended fatally. Of the 11, in two years' time, 7 remained improved, 4 relapsed, and 1 ended fatally. The best results were obtained in patients in the third, fourth, and fifth decades, when the disease had not existed long, when the spleen was enlarged, and urobilin was present with an icteroid appearance.

Yet, in 6 cases in which splenectomy had been performed, R. C. Cabot (Jour. Amer. Med. Assoc., June 26, 1915) stated that though no marked improvement could be noted in the first 2 or 3 weeks, there was a rapid rise in the cell count, more rapid than that which may be noted in a spontaneous remission or after treatment by transfusion or salvarsan. All of the cases have gone above 4,000,000 in the cell count. Four out of the 6 patients are now at work, whereas before the operation they were entirely helpless. The blood still showed very definite changes.

R. I. Lee, G. R. Minot, and B. Vincent (Amer. Med. Assoc.; Med. Rec., July 1, 1916) studied 15 cases with reference to the effect of splenectomy on the blood-forming organs to determine, if possible, the value of this procedure in altering the activity of the bone marrow. The end results in these cases certainly failed to show any permanent results from this procedure. The ultimate progress of the disease was not changed by the operation. Splenectomy seemed, however, to result in the greatest stimulation of the bone marrow of any known therapeutic measure. It acted on the whole bone marrow, and not only on the portion that formed the red cells.

The **technique of splenectomy** as given by D. C. Balfour (New York Med. Jour., June 24, 1916) is as follows: A left Battle incision is used. In freeing the spleen, bleeding is sometimes profuse. As soon as it is freed hot abdominal packs should be used and allowed to remain as long as possible. The gastrosplenic omentum may be short, and great care must be taken not to injure the stomach. The pancreas sometimes comes into the field and should be carefully avoided. The pedicle includes the artery and vein; it is usually easy to tie them; when the spleen is greatly enlarged, however, the pedicle is sometimes fan-shaped, and it is well to tie the lateral veins first.

The many cases which are but temporarily benefited by the operation suggest the need of **postoperative measures** calculated to sustain life, and perpetuate as long as possible what benefit removal of the spleen has procured. In a case reported by Coleman and Hartwell (Med. Record, June 27, 1914) in which splenectomy had been performed for pernicious anemia the patient improved subjectively and objectively some time. Later he lapsed into his former condition, and was given **neosalvarsan,** 0.2 Gm. (3 grains) intramuscularly; later 2 similar doses intravenously. At the time of the report, 6 months after the operation, the patient, while looking and feeling better, was just beginning to sit up.

To enhance the effects of splenectomy, Penrose (Southern Med. Jour., Oct., 1915), resorted to **transfusion of blood,** from a carefully selected donor, at the time of the operation. In his patient there was practically no surgical shock, and in all probability, while the splenectomy did not save him, his life was somewhat prolonged by the transfusion. R. D. McClure (New York Med. Jour., June 24, 1916) holds that failure to get better results in transfusions is due to the fact that they were not repeated sufficiently often. Great care must, however, be taken in selecting the donor. In a series of 94 cases treated by **splenectomy and persistent transfusion,** 53 showed improvement, 34 no improvement, and 7 harmful results.

From a close study of 6 personal and 30 other cases, E. Lindeman (Jour. Amer. Med. Assoc., Feb. 13, 1915) concludes that splenectomy plays an important part in the course of events in this disease by reducing the blood destruction and preventing the extreme blood crises. It does not cure the disease however; the patients still maintain the blood-picture of a primary anemia, though clinically normal. Cases should be selected carefully, and those showing petechiæ, hemorrhage, mental disturbances and marked cord disturbances should be considered unfavorable. **Blood-transfusion** should be practised before splenectomy.

Thorium has been recommended by various German clinicians, but the reports followed so soon after its use that they could not be accepted as affording any idea of its actual value. Indeed, Flörcken (Münch. med. Woch., June 9, 1914), after trying it in 4 cases, and obtaining prolonged remissions, failed to realize a cure. In 1 case it seemed to do harm. F. E. Park (Med. Record, Mar. 8, 1913) speaks well of it, however. The patient at once began to gain, and in 4 weeks was about, the anorexia, gastric disorders and edema having gone, the blood-picture having become normal. The remedy was given almost entirely intravenously, 20,000 Maché units being injected with a glass syringe and a 27-gauge needle, into the median basilic vein, every other day, without causing irritation.

thymol in, i. 644

The *seborrheic lesions* of pernicious anemia in their early stages are sometimes very troublesome. They usually yield readily, according to Montgomery (Jour. of Cutaneous Diseases, Feb., 1913), to treatment either with **X-ray** or with **trichloracetic acid.** Treatment of this seborrheic condition often prevents the development of cancer, according to this dermatologist.

posthemorrhagic, i. 646

Pathology, i. 646.—Various authors have described certain differences which they deemed to be fundamental, but Milne's (Jour. Exper. Med., Sept., 1912) experiments indicate that although there are minor differences, all the essential features of anemia produced by toxins can be produced by hemorrhage.

Treatment.—In a comprehensive study of **blood transfusion** in the treatment of severe posthemorrhagic anemia and the hemorrhagic diseases, E. W. Peterson (Med. Rec., Apr. 15, 1916) found that in acute and chronic posthemorrhagic anemia, no other remedy would compare in efficiency with whole blood in producing hematopoietic stimulation. In the acute variety (following trauma, labor, operation, or accidental cause, or as complication of ectopic pregnancy, gastric or duodenal ulcer, typhoid fever, etc.) a single large transfusion is indicated, while in the chronic type (that resulting from repeated small losses of blood) better results are obtained by giving serial transfusions of small or moderate amounts of blood.

rheumatic, sodium salicylate in, viii. 56
iron perchloride in, viii. 56
potassium bicarbonate in, viii. 56
secondary, i. 646
Bier's hyperemia in, v. 594
blood-picture in, v. 382
cinchona in, vi. 85
diet in, vi. 77
iron in, vi. 76, 77, 85, 86, 87
laxatives in, vi. 77
rest in, vi. 77
secondary, infantile, blood-picture in v. 383
septic, cinchona extract in, vi. 85
iron in, vi. 85
splenic, viii. 308

Diagnosis, viii. 310.—In a case observed by Galloway (Brit. Jour. of Children's Dis., Mar., 1916), the patient being a boy of 8½ years, the splenomegaly and anemia were actually associated with *portal thrombosis;* almost certainly the portal thrombosis was the primary cause of the whole condition. The type of pyrexia present deserved attention. There was a sudden rise of temperature from 97.8° F. (36.6° C.) to about 106.2° F. (41.2° C.) with rigor. The lad complained of a certain amount of pain in the abdomen, and he vomited a little, but very little evidence of illness was present relative to the remarkable rise of temperature. The occurrence of fever of this character in such cases would probably assist in the recognition of portal thrombosis.

That the two morbid processes may occur separately is shown by 2 cases reported by Jack and Frew (Glasgow Med. Jour., Nov., 1914), one of splenic anemia, and one of portal thrombosis simulating it clinically. The blood-picture of the case of splenic anemia showed a moderate anemia of the chlorotic type with an extreme degree of leucopenia. The spleen was markedly enlarged but the lymphatic glands did not show any increase in size. There was no fever. The case of thrombosis of the portal vein showed nearly all the signs of chronic splenic anemia; enlarged spleen, absence of enlarged lymphatic glands, chlorotic anemia, and a low color index. Leucopenia was not present, although there was an absence of a leucocytosis. The patient had numerous and copious gastrointestinal hemorrhages, and the post-mortem examination showed a white thrombus almost filling the main trunk of the portal vein.

In a case of splenic anemia observed by Truesdale (Boston Med. and Surg. Jour., Mar. 11, 1915) in a woman aged 21 years, there was a close clinical analogy to *gastric ulcer.* The patient had a persistent disturbance of digestion, hunger between meals, intermittent attacks of hematemesis, and epigastric tenderness. During one attack examination revealed an elevation of temperature and pulse associated with a distention and a marked tenderness over the upper abdomen. Later, when an enlargement of the spleen was detected, a blood examination was made and revealed the diagnosis.

Etiology and Pathogenesis, viii. 309.—According to Pribram (Wiener klin. Woch., Oct. 2, 1913), the appearance of urobilin in the urine is the only sign known to date indicating abnormally increased destruction of blood-corpuscles. It proved impossible experimentally to induce the urobilinuria in other ways, not even by intravenous injection of substances known to be directly destructive to the blood.

Caronia (Pediatria, Oct., 1914) having applied the Wassermann test systematically to the parents of the 30 children with splenic anemia in his service during the last twelve months; he obtained a positive response in 19 cases. The syphilis in the family was accompanied by tuberculosis in 9 cases.

  arsenic in, viii. 311
  benzol in, viii. 311
  blood-picture in, v. 383
  diet, liberal, in, viii. 311
  fresh air in, viii. 311

R. C. Freeman (Jour. Amer. Med. Assoc., July 3, 1915) refers to a child with splenic anemia, showing normoblasts, megaloblasts, 60,000 white cells, etc.; who improved rapidly on the roof, relapsed when returned to the ward, and improved again when put outdoors.

  iron in, vi. 85; viii. 311
  neosalvarsan in, viii. 311
  olive oil in, viii. 311
  omentopexy in, viii. 311
  salvarsan in, iv. 226, 227; viii. 311
  sodium cacodylate in, ii. 705
  splenectomy in, viii. 311

Splenectomy in the first and second stages offers the only chance for permanent cure (mortality in these splenectomy cases is 12.5 per cent.), according to J. S. Rodman and D. P. Willard (Annals of Surg., Nov., 1913). In the third stage splenectomy will arrest further development, but will not induce a retrogression of the hepatic cirrhosis, and should be combined with **Talma's operation** (splenectomy mortality in third stage 56.25 per cent.). Yet, in a case of splenic anemia observed by T. S. Roberts (Jour. Amer. Med. Assoc., Nov. 7, 1914), splenectomy, even though done early, did not, contrary to the usual experience in these cases, arrest the disease or modify its course in any way. The clinical diagnosis of uncomplicated splenic anemia was apparently confirmed by the necropsy. The only other important pathologic condition was a moderate grade of parenchymatous nephritis, but this did not seem sufficient to account for the death of the patient. The progress of the case to the very end was like that of splenic anemia and not nephritis.

In 2 cases of splenic anemia cited by McKendrick (Glasgow Med. Jour., Oct., 1915) **splenectomy** was followed by apparent cure. Clark (Amer. Jour. of Obstet., Feb., 1916) only claims great improvement after splenectomy, although the patient in a recent letter to him considered herself cured.

  sunshine in, viii. 311
  thorium in, viii. 311

E. W. Peterson (Med. Rec., Feb. 20, 1915) reports an instance of splenomegaly with anemia commencing in infancy, the patient having no syphilis, rachitis, or malaria, in which marked improvement followed **transfusion,** followed by a recurrence of the symptoms in a more aggravated degree. Very decided improvement then followed **transfusion and splenectomy.**

  uncooked foods in, viii. 312
  X-rays in, viii. 308
symptomatic, i. 646
  olive oil in, vii. 171
toxic, i. 647
  absorbent powders in, vi. 84
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Von Jaksch's or trophic, i. 648

Symptoms.—In 1889 von Jaksch described a case of leucemia in a child of 14 months, and in the following year he reported 3 cases of enlarged spleen in children, a condition which he called anemia pseudoleucemica infantum. This was characterized by a diminution in the hemoglobin and in the number of red cells, marked persistent leucocytosis, sometimes glandular enlargement, slight enlargement of the liver, a marked enlargement of the spleen, which was out of all proportion to the size of the liver, and a tendency to recovery. The blood-picture is characterized by a great diminution in the red cells and the hemoglobin, and a persistent leucocytosis. Most of the patients show a definite tendency to recover. The abnormal blood-picture in those who lived might persist for a very long period of time. This form of anemia is frequently associated with rickets. The symptoms are those of anemia in general, pallor, edema, weakness, dyspnea, etc., a large liver, and a very large spleen, with a characteristic blood-picture. The onset is gradual and the patient usually came under observation with a well marked enlargement of the spleen.

In von Jaksch's anemia, according to R. G. Stillman (Amer. Jour. Med. Sci., Feb., 1917), the most prominent feature of the symptom-complex is an enlarged spleen, but the other hematopoietic organs must be involved more or less extensively. The treatment has been unsatisfactory in the majority of cases; in 6 cases, however, treated by **splenectomy** the operation was followed by immediate clinical improvement. Frequently they tend to recover, when almost any treatment may be followed by improvement, while others progress to a fatal issue in spite of any treatment.

Pool (Annals of Surg., lxiii, 122, 1916) reports a case of von Jaksch's anemia in a child of 18 months on whom he had performed a **splenectomy**, with good results, which had given a negative Wassermann; red count, 2,700,000; hemoglobin, 45 per cent.; white cells, 12,000; polynuclears, 47 per cent.; normoblasts and megaloblasts were present. A spleen weighing 230 grams, showing a high grade meloidization, was removed May 11, 1915. Three weeks after the operation the red blood count had risen to 4,500,000, and the hemoglobin to 60. Giffin (Annals of Surg., Dec., 1915) also states that **splenectomy** has been performed in 4 reported cases of severe types of the disease, with marked immediate improvement, and adds a fifth instance of his own.

Anencephaly.

This monstrosity is characterized by the absence in part or *in toto* of the brain and spinal cord. In most instances, however, the central nervous system is poorly developed, and the child if borne alive is idiotic in proportion as the brain is deficiently developed. A curious and suggestive feature of this condition is that the adrenal cortex is poorly, if at all, developed. Thus, Apert (La Presse Méd., Oct. 28, 1911) states that this fact was first observed by Morgagni. It has been verified in hundreds of cases of anencephaly, pseudoencephaly, cyclopia and in a limited number of cases of hydrocephaly and microcephaly.

In a case reported by F. B. Talbot (Med. Rec., Sept. 11, 1915) the child was blind, deaf, and apparently idiotic, and its metabolism was extremely low. An operation for the possible relief of the blindness showed that the hemispheres were absent and replaced by cerebrospinal fluid. When the spinal cord is alone developed more or less, the movements are mainly reflex, as stated by Bronwer (Nederl. Tijdsch. voor Gyn., Aug 16, 1913). He enumerates among the features to be ascertained the existence of syphilis, through the Wassermann test. Alfred Gordon (Med. Rec., Jan. 31, 1914) failed to obtain a positive reaction in the father of a case observed by him, but a history of alcoholism and of conception during a periodical spree.

J. T. Case (Surg., Gynec. and Obstet., Mar., 1917) was able to diagnosticate a case of anencephaly before birth by means of X-ray. This indicates the value of radiography where Cesarean section is to be performed, this operation being rendered unnecessary where the presence of a monster is ascertained.

Anesin, see Chloretone, iii. 217

Anesthesia, see various anesthetics: Ether, Chloroform, etc.

Choice of Anesthetics.—A. S. McCormick (Summit Co. Med. Soc., Akron, Ohio, Feb. 1, 1916) states that while the anesthetics most generally used are ether, nitrous oxide, chloroform, ethyl chloride, their relative merits are as follows:—

Ethyl Chloride: The anesthetic and toxic stages are so close that it is too dangerous. Death rate, 1-2550 (1905-11). Its chief use is to begin anesthesia, for which it is quick and efficacious, but even then it is too dangerous.

Chloroform: Its many good points are outweighed by its one bad—that of being a dangerous heart depressant. Death rate, 1-2000. In warm climates it is safer, the rate being 1-8000.

Nitrous Oxide: Alone it is a dangerous anesthetic. It has recently been extensively used, combined with oxygen. While safer than the original method, it is losing ground as too dangerous. The death rate, 1905-11, was 1-657. Crile states that in unskilled hands it is the most dangerous of all anesthetics.

Ether: Admitted by all as safe, it is, beyond question, the safest and best of all anesthetics. Figures vary as to death, those of Wharton being 1-16,000 cases; Baldwin, 1-50,000; Rovsing (Denmark), 1-56,000; that is, death really caused by ether. At the Mayo Hospital ether was given 49,037 times in 13 years (1900-12) without causing death.

Ether-oxygen is still safer and better. Less ether is required; the anesthesia is quiet and just deep enough; the oxygen counteracts the otherwise ether irritation; the patient's color is better than under any other anesthetic.

According to G. T. Gwathmey (N. Y. Med. Jour., Oct. 28, 1916), when the patient is properly prepared, ether may be used indifferently by either the open or closed vapor method. He denies that warmed ether vapor will not stay warmed unless held under pressure, since its vapor can be delivered to the patient at any degree of heat, regardless of pressure. Both laboratory and clinic show that **chloroform, nitrous oxide** and **oxygen,** or **ether** are safer and easier when given warm.

[An additional point in this connection is that insofar as **ether** is concerned, the danger of ether pneumonia is greatly reduced. C. E. de M. S.]

Gwathmey holds that proper preliminary medication renders any anesthesia safer, eliminates largely the possibility of reflex inhibition, and renders induction smoother. It permits the use of less anesthetic and increases very markedly the "margin of safety." A combination of **paraldehyde and potassium bromide** given **per rectum,** or **morphine** may be given **with the paraldehyde.** Animals under it, properly given, stand shock no better than those under ether.

Chloroform given by the closed method with rebreathing is, according to Gwathmey, one of the safest of all anesthetics. It is agreeable, efficient, and easily stopped upon the appearance of danger signals. Late chloroform poisoning does not occur and complications are rare.

Ether given by the vapor-method is much safer, more agreeable, more efficient, is easily controllable, simpler to administer, is not accompanied by loss of resistance against pus organisms, and not so frequently followed by complications, than ether administered by the open drop method; the latter is unscientific. It has won unmerited favor within the past few years because of its apparent simplicity of administration and its supposed safety. It should be replaced by the simpler and safer vapor method.

Oil-ether colonic anesthesia should be used whenever the anesthetist is in the way, or whenever the element of fear dominates the patient. The obese alcoholic is the best subject for this special agent.

Nitrous oxide gas should never be used alone, but always with oxygen. Preliminary medication of some kind should be used in all surgical cases unless contraindicated.

[These views are not in accord, insofar as the use of chloroform and of the vapor method, with those of the great majority of anesthetists and surgeons, but the vast experience of Dr. Gwathmey gives considerable weight to his opinion. C. E. DE M. S.]

A. D. Bevan (Jour. Amer. Med. Assoc., Oct. 23, 1915) considers that drop **ether** should be chosen as the standard general anesthetic when a prolonged anesthetic is desired with relaxation and unconsciousness. **Intrapharyngeal ether** should be chosen in mouth and jaw cases when it is desirable to remove the anesthetic apparatus from the operative field. **Nitrous oxide** should be chosen in short anesthesias in which unconsciousness is desired, and in special cases, such as kidney insufficiency. **Local infiltration anesthesia** should be chosen when the surgeon has the full co-operation of the patient, and when the field of operation can be completely infiltrated and anesthetized by a safe amount of **novocaine** and **epinephrin.**

Preliminary Narcotics.—Blumfeld (Proc. Roy. Soc. Med., viii, Sect. Anes., 15, 1915) held that the giving of narcotics preliminary to the anesthetic has great value in some cases, while in others it should not be used. As a routine measure these drugs should not be employed with the single exception of **atropine.** He had never seen or heard of any ill-effects from it so used. Scopolamine and morphine seem risky drugs to prescribe indiscriminately. After the hypodermic the patient should be undisturbed and should not walk to the operating room. The main advantages of preliminary narcotics are: (1) a quiet induction; (2) less anesthetic used; (3) diminished after-effects. Atropine contributes to the first and second.

Hewitt (Proc. Roy. Soc. Med., viii, Sect. Anes., 15, 1915) had found preliminary narcotics valuable when used with discriminating care. The anesthetist should be familiar with his patient's condition. Careful notes of 266 cases in which he had used morphine, atropine, and scopolamine in different combinations show that **atropine** is a very valuable anesthetic, preventing undue secretion and causing little after-vomiting. It has no contraindications. **Scopolamine** is to be feared, $\frac{1}{100}$ grain (0.00065 Gm.) having caused in an elderly man profound narcotization. The injections were made $\frac{3}{4}$ hour beforehand. **Morphine** is strongly contraindicated in certain cases: nose, throat, and tongue operations with hemorrhage in which it is highly important that the reflexes should return rapidly.

Boyle (Proc. Roy. Soc. Med., viii, Sect. Anes., 15, 1915) urged the advantage of the patient's seeing the anesthetist a day or 2 before operation, so that he might have a better knowledge of the patient's condition. He had witnessed the use of **morphine, atropine,** and **scopolamine.** in a war hospital. It added greatly to the comfort of both the soldiers and surgeons, the only drawback being the extreme thirst and dryness of the throat.

Fright.—Badly frightened patients, according to Scholz (Beit. z. klin. Chir., June, 1914), are inclined to tachycardia, false angina pectoris, polyuria, glycosuria, nervous diarrhea, transient numbness, angioneurotic edema, shallow, rapid breathing, with occasional deep breaths, tremor, pallor and dryness of the mouth. Carbon dioxide seems to be a special product of extreme dread. The blood-pressure in such patients suffered a constant and regular decline as the ether or chloroform was administered, until consciousness was entirely lost; the patient is exposed to various dangerous reflex processes, especially to reflex syncope from irritation by the anesthetic of the terminals of the trigeminus in the nose, the reflex action from this involving the vagus terminals in the heart and the respiration center in the medulla. This can be warded off by cocainizing the nose. The fatalities as general anesthesia is just commenced are undoubtedly due to this dangerous reflex. The whole secret is to tranquilize the patient, avoid anything suggesting force, and refrain from beginning to operate too early. Persons with an exceptional dread of the operation are exposed to peculiar dangers at the first whiffs of the anesthetic.

Breathing Test to Ascertain Condition of Heart Muscle.—General anesthesia is particularly dangerous to persons suffering from myocardial changes, a condition which does not permit of ready recognition. W. A. Schtange (Roussky Vratch, Jan. 18, 1914) found that while a healthy person can suspend breathing from 30 to 40 seconds, owing to the vigor of the heart muscle, in persons with weak hearts the time is shortened to 20 or even 10 seconds. The patient, seated in a chair, is told to take a moderately deep inspiration, and, with the mouth closed, to hold his breath as long as he can. The shorter the time the patient can suspend breathing, the greater the danger of an anesthetic, the latter being contraindicated if the time is less than 20 seconds.

Pre-anesthetic Diet.—Opie and Alford (Jour. Amer. Med. Assoc., Mar. 21, 1914), in a series of experiments upon animals, using chloroform as an anesthetic, and employing fats and meats as well as carbohydrates as foodstuffs, found animals which received carbohydrates survived; whereas all of those which received meat and fat died. The use of fats increased the susceptibility of the liver to necrosis of chloroform, while a carbohydrate diet seemed to protect the liver from this disaster.

Self-anesthesia in Field.—The Brit. Med. Jour. for Oct. 10, 1914, refers editorially to a recommendation of Prof. Schleich, that anesthetics be used in the field. The following mixture, the efficacy of which has been already tested in the present campaign, is recommended: Ethyl chloride, chloroform, and ether in the proportions of 20, 40, and 120. The man saturates a handful of cotton wool with this mixture, and presses it to his nose and mouth while he breathes deeply. He quickly loses consciousness, and no longer being able to hold the cotton wool to his face, the further administration of the anesthetic is automatically prevented.

Heating of Anesthetic.—R. C. Coburn (Med. Rec., Mar. 1, 1913) found that warming of the anesthetic vapors serves the best interests of the patient. Official hospital records and clinical reports covering hundreds of cases, show a marked conservation of the patient's vitality, and that it promotes ultimate recovery.

Trendelenburg Position as Source of Danger.—In MacCardie's opinion (Proceed. Roy. Soc. of Med., Sect. of Anes., Apr., 1914), anesthetics have frequently been blamed for complications which are really induced by the Trendelenburg posture, especially when the angle of inclination has exceeded 45 degrees. It not only promotes copious venous hemorrhage, and embarrasses pulmonary ventilation, but also puts an additional strain on the heart. Likewise it seems to be an important factor in the occurrence of post-operative pneumonia and bronchitis; and Zweifel holds it occasionally responsible for post-operative intestinal obstruction, surgical emphysema, apoplexy and acute dilatation of the stomach. Zweifel reduced the incidence of pulmonary embolism from 18 cases in 1800 operations to 3 in 800, by resorting to the posture as infrequently as possible, and then maintaining the extremities in the same horizontal plane as the body instead of allowing them to be flexed over the end of the table.

The Trendelenburg posture should be resorted to as infrequently as possible; and then only for brief periods. It should not be used at all on patients suffering from obesity, obstructed breathing, cardiac, renal or arterial complications.

Edward Martin and H. A. Hare (Therap. Gaz., July, 1914) some 25 years ago, showed that the Trendelenburg posture, or any position in which the patient's body was partially inverted, produced changes in circulation and respiration of sufficient gravity to be disastrous. Their experience, both in the laboratory and since that time with a large number of clinical cases, convinced them that the statement that there is no more certain way of killing a fat woman than by leaving her for some time in the high Trendelenburg position was fully warranted.

Shock During General Anesthesia.—F. C. Mann (Trans. Amer. Med. Assoc.; N. Y. Med. Jour., June 16, 1917) states that the most common of its causes is free hemorrhage. All persons do not react similarly to loss of blood. Trauma to the viscera is a common cause when accompanied by loss of circulatory fluid in the traumatized areas. Excessive nerve irritation is probably of rarer occurrence than clinical reports indicate. In cases of fractures and trauma to large areas of fat, pulmonary fat embolism might act as cause. The ductless glands, particularly the adrenals, are sometimes factors, possibly as primary active agents or owing to the low blood-pressure and the changes incident to the condition itself. Deep etherization may produce most of the symptoms of shock.

Post-anesthetic Intoxication.—During anesthesia the reserve of glycogen in the system is rapidly consumed, and if this supply were replenished by the administration of glucose to the patient, the possible harmful consequences of anesthesia could be in a large measure avoided. Chauvin and Oeconomos (Presse méd., Dec. 18, 1912) administer it as prophylactic in the following form:—

℞ *Glucose*	℥v (150 Gm.).
Tincture of nux vomica	♏viij (0.5 c.c.).
Tincture of cinnamon	♏xlv (3 Gm.).
Water, enough to make	℥x (300 c.c.).

M.

Where post-anesthetic intoxication is already established, glucose should be freely administered by mouth, rectum, and even intravenous injection. As in diabetic coma, alkalies should also be given.

Post-anesthetic Vomiting.—Renton (Brit. Med. Jour., Dec. 6, 1913) advises to raise the head of the patient's bed 12 inches, on blocks, leaving it in this position (Fowler's) 24 to 36 hours.

E. M. Barker (Brit. Med. Jour., Jan. 10, 1914) recommends the application after anesthesia, of eau de Cologne on a mask immediately, and allow patient to inhale this for half an hour after being placed in bed, the Cologne-water being renewed as required.

C. J. Larkey (Jour. Med. Soc. of N. J., xiv, 8, 1916) attributes post-anesthetic vomiting to the *acidosis* (*q. v.* this Index) which follows the physicochemical combination of the anesthetic with the lipoids, a process followed in hernia by increased acidity of the cell content and increased capacity for water. To prevent acidosis the preoperative preparation should include a regular diet with plenty of starchy foods up till noon of the day before operation, then a supper of cereals, milk with albumin, water, and sugar. If *acetone* is present in the urine the proteids should be cut down and the carbohydrates increased. Water containing calcium is useful, while the administration of sodium bicarbonate and lactose, 1 dram (4 Gm.) of each every 4 hours for 48 hours before operation is advisable. Following operation the patient is given a 5 per cent. solution of anhydros dextrose by the drip method per rectum, using 250 c.c. (8 ounces).

Effects on the Adrenals of Anesthetics.—Delbet, Herrenschmidt and Beauvy (Revue de Chir., Apr. 10, 1912; Amer. Jour. of Surg., July, 1912) found that the effect of prolonged chloroform administration on the medullary portion of the adrenal was diminution, and even disappearance, of both chromaffinity and adrenalin. Delbet having administered adrenalin to more than 1000 chloroformed patients, described the results as splendid. It unquestionably regularized the narcosis and diminished (in most cases eliminated) post-operative shock.

In experiments on dogs to determine the effect of ether and chloroform anesthesia on the adrenalin contents of the adrenals, Oliva (Lyon Chir., Jan., 1914) found that the decrease after chloroform was much greater than after ether, and persisted for a long time, while after ether the adrenals became normal again in 10 to 12 hours.

Untoward Effects of Adrenalin.—Levy (Brit. Med. Jour., Sept. 14, 1912) found that adrenalin exerted a very pronounced cardiac effect in chloroformed subjects. Within a few seconds, injection of 5 minims (0.3 c.c.) of the 1: 1000 solution caused pulse acceleration and a raised tension; it became more rapid and was less readily felt owing to diminished excursion. It may, or may not, be perceptibly irregular at the wrist; a few temporary pauses were noted, and then the heart suddenly ceased beating; the pupils dilated widely, and intense pallor supervened. Respiratory phenomena followed; a few deep breaths were taken, and the respirations ceased also. The writer concludes that it is *unsafe to inject adrenalin into the veins or vascular tissues* of a patient lightly under the influence of chloroform. It may be safely injected just previous to the induction, however, or into a patient fully under chloroform, or into a patient anesthetized to any degree with ether. In the case of light chloroform anesthesia the risk taken is unjustifiable.

[The injection of adrenalin into the veins is dangerous under *any* circumstance. C. E. DE M. S.]

Depree (Brit. Med. Jour., Apr. 26, 1913) observed sudden death from cardiac arrest after the injection of 5 minims (0.3 c.c.) of a 1: 1000 solution of adrenalin in the nose of a patient who had been anesthetized with chloroform. At the time of the injection anesthesia was light, the corneal reflex being brisk, and no more chloroform was given. All attempts to resuscitate the heart failed.

After-effects on Nervous System.—E. Weber (Med. Klinik, xi., 991, 1915) studied the means of preventing the injurious action of anesthetics on the central nervous system in the present war. After local anesthesia there is severe dilatation or *atony of the vessels,* lasting for 2 or 3 days. After chloroform anesthesia it is much more pronounced and long-continued. The morbid vascular reaction was sometimes manifest from 1 to 6 weeks after operation. These phenomena are explained by the fact that the central vasomotor mechanism is extremely sensitive to injurious influences brought to it by the blood. This mechanism, however, seems to be restored to normal by the stimulating action of alternate hot and cold douches. The injurious effect of ether seemed to stand about midway between that exerted by chloroform and by local anesthesia.

Immediately after an operation under local anesthesia one is impressed by the well-being of the patient and the diminished after-pain compared with that after an operation under narcosis. A. E. Hertzler (Jour. Amer.

Med. Assoc., Dec. 5, 1914) accounts for this largely by the preliminary use of a dose of **morphin,** for which the local anesthetic gets the credit. The patient escapes the ether, but in considering after-pain with local anesthesia, one must take account of the hyperesthesia which often occurs about the insensitive region, and which may last for days, and be difficult to control. This is commonly disregarded by the operator, and has received scant recognition in the literature. These remarks apply especially when **novocaine,** in combination with **epinephrin,** is the local anesthetic used, because of its evanescence. There are some cases, however, in which local anesthesia may be used with confidence to prevent after-pain. **Quinine,** when properly used, with full consideration for the possible hyperesthetic zones, is of great value on account of its lasting effects.

blood-pressure in, ii. 500
caudal, viii. 201, 216
epidural, viii. 216
extradural, viii. 216
in bronchoscopy, vi. 251
in esophagoscopy, vi. 246
in laryngoscopy, vi. 244
infiltration, see local, under the present heading.
  eucaine hydrochloride in, iv, 700, 702
intra-arterial, iii. 500
intratracheal insufflation, iv. 679; vi. 255

By means of intratracheal insufflation one of the dangerous effects of ether and chloroform is eliminated, that resulting from partial or complete respiratory paralysis, for the respiration is produced artificially according to Githens and Meltzer (Jour. Amer. Med. Assoc., Apr. 26, 1913). It does not necessarily cause apnea, for spontaneous respiratory movements may still be detected. When the dose of ether is too large, the first sign is the cessation of the spontaneous respiration—a danger signal that the etherization has entered the toxic zone, and since it may be hours before the real danger appears, it is a safe and valuable signal. The results with chloroform are different; when the anesthetic dose is excessive, respiration and blood-pressure go down practically together, and in a comparatively short time.

According to R. C. Coburn (Med. Rec., Mar. 3, 1917) the *insufflation* methods of anesthesia will survive the test of time, as they have a scientific foundation. In all 3 forms of insufflation, the tracheal, the pharyngeal, and the buccal, there are common advantages over the usual inhalation methods. These advantages are that the vapor is warmed before delivery to the patient, and the rate of administration can be more evenly maintained, with consequent smoother anesthesia and a lessened liability to overanesthesia. In the tracheal and pharyngeal insufflation the obstruction at the base of the tongue is automatically removed, and therefore there is no devitalization of the patient by forced breathing. The insufflation method is especially indicated in operations upon the throat and the chest.

Chevalier Jackson (Surg., Gynec., and Obstet., Oct., 1913), states that the *larynx should be inspected* before introducing the insufflation tube, to detect the presence of any disease in the larynx, and to estimate the size of the larynx, so that the proper insufflation tube may be selected, to make sure there is ample laryngeal lumen around the tube for the return flow. The post-anesthetic laryngoscopy in 80 cases has shown that there is no reaction in the larynx from the presence of the tube, even in a prolonged anesthesia by this method.

H. C. Luke (Surg., Gynec., and Obstet., Feb., 1913) describes a case in which extensive subcutaneous emphysema followed intratracheal anesthesia. Second accident in New York city; the first was fatal; showing method is not without danger, and that a *safety valve* (so that the pressure cannot exceed 15 mm. Hg.) is absolutely essential. The following may occur: direct trauma due to the catheter, either during introduction or afterward, or from pressure of the sand bags under the neck; trauma by overdistension, by inserting catheter too far, and thereby tightly plugging a bronchus, leading to rupture of the lung; obstruction from extreme flexion of head and pressure of the sand bags under the neck; the catheter may be too large.

Jackson's insufflation tubes, vi. 255

Jackson's technique, vi. 255

intravenous, iv. 686

Candler (Jour. Mich. State Med. Soc., June, 1914) states that general anesthesia by the intravenous method is not a twentieth century discovery, having been employed by Ore as early as 1872. Ore used chloral hydrate as the hypnotic agent in 51 cases, with considerable success. A number of fatalities discouraged its employment until taken up by Burckhardt in 1909, who tried anesthesia intravenously on the human subject, after experiments on the lower animals. Chloroform was first used, but abandoned for ether, deemed much safer. One year later 6 surgeons at the Berlin Surgical Congress corroborated the work of Burckhardt. The intravenous method was first employed in America in the fall of 1912 by Honan, of the Metropolitan Hospital, New York. In February, 1913, Honan reported 78 cases. Since this time the intravenous method has been employed in over 300 cases at the Metropolitan Hospital and elsewhere. Federoff collected 500 cases from 3 Russian clinics, in which **hedonal** 75 per cent. in normal saline was used. In these cases there were no deaths which could be ascribed to the anesthetic. Kummell in his contribution to Keen's Surgery states that his experience with intravenous anesthesia has been so very favorable that he looked upon its general employment as very desirable.

The writer states that the objection to the use of hedonal is that a large number of red blood-corpuscles undergo hemolysis, while paraldehyde increases blood-pressure beyond the limits of safety. He advocates the use of **isopral** and **ether** 7 per cent. in normal saline solution. Isopral (trichlorisopropyl alcohol) is a white crystalline substance closely related to chloral hydrate, and lowers blood-pressure. The writer employs a modification of Honan's apparatus.

Keppler and Breslauer (Deut. Zeit. f. Chir., cxx, 1913) quote Ritter as the discoverer of the fact that by directly injecting into the blood cocaine or its derivatives it is possible to anesthetize without producing a general toxic effect upon the whole central nervous system; they regard the employment of such drugs as uncertain in their effect and dangerous. They found that trional or paraldehyde causes sleep which lasts 2 or more days. Amyl hydrate caused nervousness and clonic cramps. Chloral, formamid, sulphonal, and veronal dissolve with great difficulty. The sodium salt of veronal is too dangerous because of the paralytic effect on the medulla. Urethan and hedonal had to be given in doses entirely too large to be safe; urethan caused infarcts in the kidney in one instance. The bromides are too weak.

Experimentally they had best results from **pantopon**, using about ¾ to 1 cg. (⅙ to ⅛ grain) per kilo of body weight. This is readily dissolved. There were no after-effects, and narcosis passed off promptly, the cerebral functions being abolished long before the reflexes were materially blunted.

Nassetti (Policlinico, Surg. Sect., No. 12, 1912) tried various anesthetics in different concentrations, and examined the histologic effect on the blood-vessels and tissues. No symptoms of intoxication were noticed in animals, not even when a fatal dose was injected; no acute intoxication followed when the constricting band was removed. The best results were obtained when the entire limb was anesthetized or the hands or feet alone. The method will prove very useful in cases contraindicating general anesthesia.

hedonal in, iv. 690
isaprol in, iv. 688
paraldehyde in, iv. 690
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intubation, iv. 679
liquid air, iii. 531
local, **carbon-dioxide snow** in, vii. 786

Comparative Merits of Various Local Anesthetics.—G. MacGowan (Calif. State Jour. of Med., Jan., 1916) holds that a local anesthetic to be valuable must not of itself be a cause of pain, either before its action is established or after it has ceased. None of the drugs are used pure, but all need to be dissolved in fluids isotonic with the juices that bathe the body cells, such as a 0.9 per cent. solution of common salt. **Cocaine,** the first local anesthetic to be discovered, has been abandoned because of its disadvantages except in eye and nasal surgery, and sometimes in urethral operations where the newer and safer anesthetics are inactive. **Tropacocaine** is the ideal agent for spinal anesthesia. **Beta-eucaine** does not differ widely from cocaine; as a protoplasmic poison, it produces the same symptoms, but the dose required is greater. It is slightly less powerful as a local anesthetic, does not diffuse so well, and is more irritating. Its solutions are stable and can be sterilized by boiling. **Acoin** is a dangerous poison, and is decomposed readily by alkalies. **Holocaine** anesthetizes the eye without dilating the pupil, producing dryness of the cornea, or preventing bleeding. **Chloretone** or **anesol** is very irritating. **Orthoform, anesthesin, subcutin, propesin,** and **zykloform** are all slightly soluble powders with anesthetic properties when brought in contact with exposed nerve filaments or endings. They are used upon the skin in dusting powders or salves, in the rectum or vagina as suppositories or salves, and are also useful in the nose, throat, and intestinal tract, especially the stomach. The most efficient of the group is **anesthesin,** over which the others possess no advantages. **Stovaine** has been recommended for spinal anesthesia, but is irritating and painful for infiltration anesthesia. In a 1 per cent. solution it is useful as a local anesthetic when used by instillation for an instrumental examination of the urethra and bladder. **Alypin** is a close relative of stovaine, is readily soluble in watery solutions, is less active and more irritating than cocaine when used hypodermically, and its toxic symptoms are similar to those of the latter. **Novocaine** is but feebly poisonous, its watery solutions up to 10 per cent. are not irritating; it may be sterilized and resterilized without marked effect upon its anesthetic properties, which are greater than those of any other drug used for local anesthesia, when combined with suprarenine, with the exception of cocaine. It can be applied pure to the cornea and to freshly denuded surfaces without causing pain or subsequent edema. For infiltration anesthesia isotonic solutions of ½, 1, 2, and 4 per cent. are the most useful; greater concentrations are not necessary and should not be used, even though it is only feebly toxic. **Hydrochloride of quinine and urea** in watery solutions of from 0.25 to 1 per cent. causes the formation of a fibrinous exudate in tissues infiltrated with it, which delays the healing of wounds. Tetanus has been observed after this salt has been used. Its one valuable quality is the length of time its anesthetic effects last, sometimes for many days, on account of which it may be used to inhibit pain in intense and persistently localized neuritis, and in blocking the sensation of itching in circumscribed and chronically thickened patches of eczema.

All of these drugs are incompatible *with* the physiological action of *adrenalin,* with the exception of cocaine and **novocaine**. The only one that is relatively non-toxic, non-irritant at the time of use and afterward, soluble in water, capable of sterilization by heat, and not antagonistic to adrenalin is **novocaine**, but for application to unbroken mucous membranes **stovaine** and the **nitrate of alypin** are superior to it.

Local Anesthesia for Children.—Reviewing his experience with various operations done on children under 7 with local anesthesia alone, the list including 9 herniotomies on children under 4, La Chapelle (Nederlandsch Tijd. v. Geneeskunde, Dec. 9, 1916) concludes that local anesthesia is about as applicable to children as to adults.

Lundgren, Schele, and S. Vedin (Jour. Amer. Med. Assoc., Apr. 26, 1913) state that local anesthesia may be induced by **cataphoresis**. The anesthetic (10 per cent. solution of **novocaine in adrenalin solution**) is dropped on filter paper folded several times, or the paper is first dipped into the solution; a pad is cut from this, the size of the electrode and the continuous current applied (110 volts), the pad placed under the positive electrode covering 1⅕ square inches; the other electrode is held in the hand. Five per cent. solution of cocaine in adrenalin may be used.

cocaine in, iii. 483

Wolff Freudenthal (Med. Rec., July 20, 1912) urges that, invaluable as *local anesthetics* are, they *carry in their path many a danger.* A small portion of the fluid always gets into a vein or lymph duct and may be carried quickly into the circulation. In non-fatal cases one may merely notice a slight faintness, a small pulse, and heavy breathing. In more severe cases there are cold perspiration, dryness in the throat, a feeling of impending dissolution, hallucinations, laughter, unconsciousness, epileptiform attacks, coma, and finally paralysis of the respiratory center. Weigand found that in 17 intoxications occurring after application of **cocaine** to the nasal mucosa there was no fatal result; in 12 poisonings after the application in the mouth and pharynx, 2 deaths resulted, and in 11 poisonings after anesthetizing the larynx, 1 death. G. B. Wood observed that in about 10 per cent. of his patients in whom **adrenalin** had been applied in full strength, secondary vasomotor relaxation occurred. B. Seymour Jones had 3 cases showing the alarming effect of the sudden absorption of adrenalin on the septum when the circulatory system was depressed by chloroform.

The writer warns against injecting any cocaine or adrenalin preparations into the turbinated bodies, for the absorption is too rapid and the dangers are too many. For removal of the tonsils most operators, however, use cocaine-adrenalin injections into the crypts and around the organ. But several deaths have been recorded in the literature, and perhaps many more have occurred unrecorded. The writer uses for injections a solution consisting of ⅕ to 1 per cent. cocaine, plus adrenalin (1:10,000). In the present state of the question he does not feel safe in using a stronger solution.

One may almost make it a rule that the slower adrenalin is injected, and the more diluted it is, the less danger there will be.

Wishart (Can. Pract. and Review, Jan., 1916) protests against the increasing tendency to perform operations upon the nose and throat under general anesthesia. In adults it is seldom necessary to resect the nasal septum, or remove the tonsils, to say nothing of operations upon the turminals or the ethmoid, except with local anesthesia.

Perfect *ischemia and anesthesia* may be obtained by carefully packing the nose with equal parts of a 10 per cent. solution of cocaine, and a 1 to 1000 solution of **adrenalin**, 1 hour before operation, and the sense of shock may be abolished, as Crile has shown, by the use of **morphia** combined with **atropine**, and, in selected cases, with **hyoscine.** If the operator prefers the injection method, he should use **novocaine,** ¼ per cent., with the addition of not more than 6 minims (0.36 c.c.) of 1:1000 solution of **adrenalin** to each dram (4 Gm.). The injection should be made about 15 to 30 minutes before operation. Whenever possible, a solution of novocaine should be selected instead of cocaine, as it has toxicity of one-tenth that of cocaine.

To ward off local after-pain F. Honigmann (Zentralbl. f. Chir., Jan. 31, 1914) injects a small dose of **morphine** before starting the anesthetization, when about to operate on acutely inflamed tissues, or when for any other reason he anticipates that such pain will follow. In aseptic cases it is rarely necessary to repeat the injection toward evening. In ambulant practice he prescribes a mixture of **morphine and aspirin,** or **pyramidon** in 2 powders, one to be taken as soon as the pain appears, the other if needed later for sleep. Aspirin or pyramidon alone is given when pain is not to be expected.

Bechtol (Jour. Ind. State Med. Assoc., Dec. 15, 1915) says that **novocaine** and **adrenalin** for local anesthesia is readily performed. For minor operations, or when working in a home, sterile tablets of from ⅓ to 1 grain (0.02 to 0.06 Gm.) are employed, and are ready as soon as dissolved in sterile water. In hospital practice, for an ordinary hernia or laparotomy, 2 to 3 ounces (60 to 90 Gm.) of a 0.5 per cent. solution, to which is added 6 to 10 drops of a 1:1000 adrenalin solution, is prepared by first boiling the crystals of novocaine and later adding adrenalin. A fresh solution is made for each operation. The maximum dose of novocaine is variously given as from 7½ to 22 grains (0.48 to 1.4 Gm.).

In operations on the rectum, H. Treves-Barber (Louisville Monthly Journal, Oct., 1914) advocates local anesthesia by novocaine and adrenalin, using the technique evolved and very successfully employed by Prof. Reclus, as follows:—

Novocaine	7½ gr. (0.5 Gm.).
Adrenalin 1:1000	gtt. xxiv.
Physiolog. saline sol. steril.	3⅓ oz. (100 c.c.).

Fifty to 80 c.c. (1⅗ to 2⅔ ounces) of this solution can be injected without any ill effects.

The patient is purged the day before operation, shaved and prepared for operation in the usual way. After being placed on the table in the exaggerated lithotomy position, a pledget of cotton saturated with the novocaine-adrenalin solution is carried into the rectum with the aid of a pair of artery forceps. This procedure is repeated until several pledgets have been inserted, and these are left *in situ* until injection of the external structures is complete. A glass syringe with a half-curved rather stout and long hypodermic needle is used for injecting the field of operation. The muco-cutaneous margin encircling the anus should first be injected, after which the needle should be inserted at the base of the swelling caused by the fluid inserted in the injection. This procedure is repeated until a ring of injected fluid surrounds the anus. The pledgets of cotton are now removed from the rectum, and the operator proceeds to inject the internal sphincter muscle. To accomplish this purpose the forefinger of the left hand is hooked behind the sphincter muscle, which is pulled forward and steadied; a long straight needle attached to the syringe is pushed perpendicularly to the skin into the muscle, and a series of injections are made encircling the bowel as in the superficial external tissues already described.

Definite paresthesia in the arm or hand must be obtained before any solution is injected. The injection should consist of 20 c.c. of a 2 per cent. solution of novocaine. Any solution injected near the plexus before paresthesia is obtained may interfere with obtaining this paresthesia, and so prevent localizations of the plexus. From 5 to 15 minutes, perhaps 30 minutes, are required for anesthesia to develop. To avoid injection of solution into a vein the plexus should be sought with the detached needle (blood will flow freely if vein is punctured). A fine platinum-iridium needle, 2.4 inches long, is advised. Neil and Crooks (Brit. Med. Jour., Feb. 22, 1913).

guaiacol in, v. 148
holocaine in, v. 537
olive oil in, vii. 171
orthoform in, vii. 216
phenol in, vii. 443

lumbar, viii. 201

Lumbar anesthesia was used by E. Peterson (Ugeskrift f. Laeger, Oct. 5, 1916) in 136 operations, including gastro-enterostomies and hysterectomies. Good results were obtained in patients between 70 and 80; 1 woman of 77 having exarticulation of the hip-joint for sarcoma done under it alone. Untoward effects were few and slight; in a few cases there was a chill and high temperature a few hours which soon dropped to normal. In one extremely debilitated case there was collapse, requiring artificial respiration and massage of the heart. Severe headache persisting for several days only in 2 cases, but slight headache was not uncommon. It always yielded to a little **acetyl-salicylic acid**.

paravertebral.

According to Siegel (Zeit. f. Geburtsh. u. Gynäk., lxxix, Nu. 1, 1916), paravertebral anesthesia surpasses all others for the gynecologic-obstetric field. In 1000 cases it was complete enough for the purpose in 95 per cent. They included 419 abdominal operations, 17 nephrectomies, 249 vaginal operations, and 52 obstetrical operations with 2 Porro cesarean sections. Only a small amount of supplemental inhalation narcosis was necessary. Except for temporary pallor, and an ephemeral pulse increase, no untoward symptoms appeared in 862 cases. In 7 per cent. there was slight sweating; in 3.8 per cent. a temporary inclination to vomit; and in 2.6 per cent. actual vomiting occurred. Neither death nor disturbance of respiration occurred. The after-symptoms were very slight and temporary. Its only disadvantage is that each nerve has to be anesthetized separately.

The technique of cervical paravertebral anesthesia as given by A. D. Santoni (N. Y. Med. Jour., from Presse méd., Feb. 1, 1917) is as follows: The patient lies on the side, with the head slightly flexed so as to render palpable the 7th cervical spinous process. A line of intradermal infiltration is established 3 centimeters from the median line and, the 7th cervical having been located, the needle is introduced at a level 5 millimeters above it until the resistance of the transverse process is felt. The external border of this process is next groped for with the point of the needle, and as soon as the bone is missed the needle is pointed 20 to 25° downward and introduced 10 to 15 millimeters further. The 7th cervical nerve has now been reached and 3 c.c. (45 minims) of a 2 per cent. **novocaine** saline solution are injected locally in all directions. The points of injection for the other cervical roots are, respectively, 15, 30, 45, 60, 70, and 80 millimeters above that for the 7th. For operations on the arm the last 4 cervical roots and the 1st thoracic are injected. The last named, after emerging, winds round the neck of the first rib and passes in the infraclavicular space. To inject it the needle is introduced in the same vertical line as for the cervical roots, but 1 fingerbreadth below the point for the 7th cervical. The needle, having come to a stop against the 1st rib, is carried to its inferior margin and introduced 1 centimeter further, after which the anesthetizing injection is made.

Not over 30 c.c. (1 ounce) of the 2

per cent. novocaine solution should be used. Testing the effects of solutions of varying tonicity, the author noticed that whereas hypotonic solutions yielded a rapid anesthesia lasting but 1 hour, hypertonic solutions acted more slowly but also more persistently. In most instances good anesthesia was obtained by infiltration with a solution of novocaine in 1:400 sodium chloride solution.

pharyngeal, vii. 434
rectal, iv. 690
  ethyl bromide in, iv. 690
  oxygen in, iv. 690
sacral, viii. 201, 216
Schleich's infiltration, iii. 496
spinal, viii. 201

Knight (Amer. Jour. Obstet., June, 1916) reports 305 cases—all below the diaphragm, almost all below the umbilicus. There was no fatality. The author gives the mortality records of various observers: Strauss 1 in 3500; McCardie 29 in 23,955, or 1 death in every 826 cases; König 12 in 2400 cases, or 1 in 200; Thomaschewsky, 1 in 17,847. The majority of fatalities occurred in the early experience with this method, but with the improvement of technique the mortality is low. In the writer's cases, Dr. W. Wayne Babcock's solution of **stovaine** was used. Its specific gravity is less than that of the spinal fluid, and consequently the patient is placed in an exaggerated Trendelenburg position immediately, so as to limit its action to the lower filaments of the cord. Should the patient be unable to sit up, the injection may be made in the horizontal position. Babcock's solution is dispensed in 2 c.c. ampoules, sterilized and ready for injection.

[See Professor Babcock's article (1916) in the eighth volume, page 201, for all details.]

Boyd and Yount (Jour. Amer. Med. Assoc., Feb. 24, 1917) in a compilation of the results of spinal analgesia in 6229 cases, by 27 physicians at the Isthmus, the patients being mainly native Panamanians or West Indian negroes, found that Americans and Europeans of the better class seemed more prone to toxic manifestations and unfavorable aftereffects than the former. The method was usually avoided in children under 5 years, in those prejudiced against it, very nervous patients, those with marked spinal deformity or disease of the spinal cord or peripheral nerves, those with superficial infection in the region of puncture. This extensive experience showed that the method was as safe as the use of ether in the long run, and had certain advantages and disadvantages which were no more marked than was the case with ether. In operations on parts of the body below the umbilicus it had proved a most satisfactory method and was particularly effective in abolishing all muscular spasm; also in a large number of conditions in which the use of a general anesthetic would have proved decidedly dangerous or would, for various reasons, have been absolutely contraindicated.

Anesthesin, i. 664
Aneurism, i. 665
    Abrams's method in, i. 682
  treatment in general, i. 675
  aortic, i. 670

Symptoms, i. 670.—Lemann (Amer. Jour. Med. Sci., Aug., 1916) holds that if we wait for the complete classical clinical picture of thoracic aneurism given in textbooks, we shall miss the vast majority of cases in which the prognosis is such as to preclude any aid. Only 2 phenomena were present in any considerable percentage of the cases, *pain* and *dullness*. The pain may be substernal, vertebral, may extend down either arm or up the side of the neck to the occiput. The pain may be continuous or may occur as typical attacks of angina. Percussion seems to yield earlier information of an intrathoracic growth than any other method of physical examination. The dullness in Lemann's cases was always outspoken and required no particular method nor manipulation to demonstrate.

Nikolaieff (Russky Vratch, xv, no. 11, 1916) found aortic aneurism in 86.3 per cent. of cases of internal aneurism, while the pulmonary artery was involved in only 2 cases, that is, in 0.7 per cent. The main symptoms in a personal case were dyspnea, repeated and abundant hemoptysis, which yielded to rest, and a marked systolic murmur heard at the back, especially in the interscapular space at the base of the lungs. The auscultation phenomena at the base of the heart were changeable. Sometimes systolic, sometimes diastolic murmurs, were heard, and they were very inconstant, appearing only during disturbed compensation in the lesser blood-circle. Necropsy revealed some narrowing of the aortic orifice, and considerable dilatation of the branches of the pulmonary artery.

Blood-pressure.—In 40 cases of aortic aneurism investigated at the Seamen's Hospital, Greenwich, by Magmundo Mackinnon (Brit. Med. Jour., Oct. 4, 1913), the blood-pressure on admission was invariably above normal. A difference of 5 or 10 mm. Hg. between the two arms was of little importance, but a marked difference of from 15 to 20 mm. or so was strong evidence of the presence of aneurism.

Hemoptysis from perforated aortic aneurism was witnessed by Hampeln (Deut. med. Woch., May 1, 1913) some 15 times owing to tracheal or bronchial perforation, all the cases being necessarily fatal. But with the diagnosis established, hemoptysis may not, however, mean that the aneurism has burst. Thus it may be due to atheroma of the pulmonary vessels, or the aneurism itself, still intact, may cause a perforation into the pulmonary artery. In a case of rupture of an aortic aneurism into the upper vena cava reported by A. Klein (Deut. med. Woch., Oct. 9, 1913), death was preceded by a high grade of dyspnea, edema, and cyanosis of the head, neck, the upper extremities, and of the upper portion of the thorax to the height of the xiphoid process. Seventeen similar cases are on record.

Hemothorax.—A case of hemothorax caused by a rupture of a dissecting aneurism of the aorta, the rupture being due apparently to running for a train, and, unlike the usual termination of such cases, ending in recovery, was treated by E. H. Goodman (Jour. Amer. Med. Assoc., Apr. 18, 1914) by **aspiration**; the patient complained of nothing after the thoracentesis. Four months after leaving the hospital the physical signs were much the same as when he left.

Rheumatic Form.—Soprana and Piazza (Arch. de med. exper., xxvii, 55, 1916) saw a case with multiple aneurisms of the aorta associated with rheumatism. The patient was a girl, aged 21 years, who had never had a previous attack of rheumatism. The fatal attack began suddenly and very acutely. She died within a month after the onset. The infection of the aortic tissues had occurred, in their opinion, by the carriage of the microorganisms to the adventitia. This is the more common mode of infection for aortic lesions. The aneurisms develop only after the infection and its inflammation have brought about a certain amount of dissolution of the aortic wall.

[Such cases are due, from my viewpoint, to autolysis brought about by excessive proteolytic activity of the antibodies. C. E. de M. S.]

Pulmonary Symptoms.—The various pulmonary lesions caused by or associated with aortic aneurism, according to Bramwell (Edinburgh Med. Jour., Feb., 1916), include collapse, bronchiectasis, chronic pneumonia, and, rarely, localized gangrenous areas around the bronchi. They are apt to resemble pleuritic effusion, malignant disease, cirrhosis, and phthisis very closely. In some cases tuberculosis develops in the lung, which is thus collapsed or affected with chronic pneumonia.

Cases in which an aneurism presses upon the lung causing a localized pleurisy are comparatively common. In such instances repeated attacks of hemoptysis are apt to occur. Pressure on the main bronchus usually produces considerable dyspnea, but in some cases it is paroxysmal. An extremely irritable and troublesome cough with copious thin watery expectoration is often present. Pressure on the root of the lung is occasionally followed by destructive inflammation of the lung tissue.

Diagnosis, i. 674.—Two cases of aortic aneurism were recorded by S. Solis Cohen (Interstate Med. Jour., Jan., 1912), which were mistaken for asthma, owing to absence of tumor, pulsation, thrill and bruit. The diagnosis was made by inspection and confirmed by roentgenograms.

Respiration symptoms of aneurism of the aorta were noted by Hoesslin (Münch. med. Woch., lix, 24, 1912) in a case in which there was gradually increasing compression of the left bronchus and trachea. For 2 days preceding death, the inspiration was stridulous and somewhat prolonged, and the expiration interrupted, these interruptions being synchronous with diastole. The compression of the trachea had progressed to such an extent that air could escape from the lungs only during diastole, when the sac diminished in size.

Kienböck has noted a new diagnostic feature. *Circumscribed bulging of the sternum* is almost always accompanied by a general dilatation of the aorta. If this is absent aneurism can be excluded. In such cases an oblique view shows, according to O. Huber (Berl. klin. Woch., July 1, 1912), the post-aortic space between the spinal column and the shadow of the vessels to be entirely filled up.

F. de Haviland Hall (Lancet, Mar. 29, 1913) summarizes *variations in pulse* as follows: complete absence of radial pulse; inequality of the 2 radial pulses in volume, as felt by finger or shown by sphygmomanometer; difference in the character of the sphygmogram; and delay in pulse at one or other wrist.

For satisfactory screen work in *fluoroscopic examination,* the observer should be in the dark room, according to R. D. Carman (Jour. Mo. State Med. Assoc., June, 1913) for 15 or 20 minutes before the examination, so that his eyes may become more sensitive to the dim light. He avoids prolonged examinations as dangerous to patient and observer. Familiarity of normal appearances is necessary. Final judgment should rest not alone on X-ray findings, but on clinical and all other obtainable evidence.

Roentgenoscopy is a valuable adjunct in diagnosis. The shadow cast by the aneurism moves with the pulse, according to M. Letulle (Presse méd., Mar. 15, 1913). M. J. Hayes (Dublin Jour. Med. Sci., Mar., 1912) finds that the thorax and contents are readily examined by the X-ray, the lungs being transparent to the rays by reason of the air they contain, and the heart and great thoracic vessels, being opaque, cast dense shadows. Examination by the screen, or fluoroscope, is more satisfactory than that of the negative, which is mainly useful as a permanent record of the exact conditions at the time of examination. For *screen examinations,* the sensibility of the observer's retina must be increased by a previous stay of from 5 to 15 minutes in total darkness, and the room in which the examination is made should be wholly dark.

Aortic aneurisms can usually be easily recognized, but it is not always possible to detect those of the innominate, left subclavian, or the left common carotid, by reason of the convergence of the upper part of the thorax and the smaller amount of transparent lung tissue therein. While aneurisms to the right of the vertical column are of the ascending aorta, and those on the left of the descending aorta, a large aneurism of the arch may extend both to the right and to the left of the sternum and vertebral column, or it may extend upward toward the neck.

In aneurism of the anterior wall of the aorta E. H. Goodman (Med. Rec., Sept. 19, 1914) finds that the diagnosis is materially facilitated by the presence of a pulsating tumor; but in dilatation of the posterior wall, the customary signs of aneurism fail. In all cases with obscure left-sided abdominal pain (with, at times, hyperesthesia over the painful area), aneurism of the abdominal aorta should be suspected and a fluoroscopic examination, with careful X-ray photographs, made to establish the diagnosis.

Etiology, i. 666.—Acuna (Semana Medica, Oct. 7, 1915) observed an aneurism of the aorta in a boy of 12 years. This condition is rare in childhood. Although the Wassermann was negative in the child, it was strongly positive in the mother, thus confirming the hereditary syphilitic nature of the lesion. According to Friedländer (Berl. klin. Woch., Nov. 8, 1915), the tendency now is to exaggerate the share of syphilis in the production of aneurism of the aorta and other vascular affections. While the artificial production of aneurism by injection of spirochetes, observed by Vanzetti, is demonstrative evidence, von Zeissl and the author never found any special tendency to aneurisms among the thousands of syphilitics in the dermatologic clinic of the Jubilee Hospital, Vienna. Yet, Sjoblom (Finska Läkare Handl., lviii, No. 5, 1916) obtained a history of syphilis in over 77 per cent. of 34 cases of aortic aneurism at the Helsingfors Hospital since 1900. In the 10 tested for the Wassermann reaction, it was positive in 90 per cent. The shortest interval since infection was 7 years, the longest 35. The youngest patient was 30 at the time of his death, the oldest 70. In 9 cases rupture of the aneurism was the cause of death, and in 13, interference with the action of the heart. In all but 2 cases the aneurism was in the thoracic aorta.

Five instances of aortic aneurism were observed by Morgan and Teacher (Brit. Med. Jour., Oct. 24, 1914) which were due to bacterial infection. Each was associated with ulcerative endocarditis, and, while in only one was bacterial examination made, the signs in the others were perfectly typical of an acute infective endocarditis.

Treatment, i. 675.—In aneurism of the aorta, Selian Neuhof (Amer. Jour. Med. Sci., May, 1916) urges antisyphilitic treatment, because syphilis is the fundamental disease in the majority of cases. The best routine procedure is an intravenous injection of 0.2 Gm. (3 grains) **salvarsan** every week until three doses have been given; then, if indicated, it may be repeated in 0.6- Gm. (10 grains) doses a month or 2 apart. In the interim intramuscular injections of **mercury** about twice a week should be given in conjunction with **potassium iodide**, as this treatment often is efficacious and is followed by marked improvement.

H. A. Hare (Jour. Amer. Med. Assoc., Apr. 13, 1912) performed the operation of **wiring** of sacculated aortic aneurism of various parts of the aortic arch 22 times altogether, including 6 here presented. In every instance the growth was so large that death in the early future was imminent and in several the wall of the sac was so thin as to be blue or blackish in hue and bloody serum was oozing through the skin. In most of the cases death because of the aneurism eventually took place, but in many if not all he thinks life was prolonged, and relief or partial relief from the severe pain was obtained. Much depends on the condition of the aortic wall, and if the aneurism is due solely to traumatism there is a chance for success. On the other hand, if the vessel wall is extensively or severely diseased the treatment is like trying to mend a rotten hose. The operation is the only one that offers material hope of prolonged life, this having been prolonged in one case at least five years. It is justified by the prompt relief of pain, which nearly always ensues and lasts unless the growth, extending in another direction, creates a new source of pain. The diagnosis of saccural aneurism should always be confirmed by X-ray examination, as this operation is contraindicated in fusiform aneurism.

Following wiring of aneurisms, in Finney's (Annals of Surg., May, 1912) 23 cases, only 2 patients are still living, 1 after nearly 3 years, the other not quite 1 year. Both had aneurisms of the thoracic aorta. All were young males one-half of whom gave a history of lues. One who denied it had a positive Wassermann reaction. Over 25 per cent. admitted they used alcohol to excess. In 3 instances, the trouble was of traumatic origin. The results of this operation, when one considers the absolutely hopeless condition of the patient under any other method of treatment, would seem to justify its employment in every case where it is not otherwise contraindicated.

W. C. Lusk (Annals of Surg., lxiv, 680, 1916) describes 2 cases of thoracic aneurism upon which the Moore-Corradi operation of **wiring with electrolysis** had been performed over 4 years previously. In the first, 17 feet of No. 29 gold "clasp" wire had been used and in the second 22½ feet. Active antisyphilitic treatment was instituted in both patients with great benefit. The best result is obtained when the wire is so introduced as to bring it as much as possible in contact with the wall of the aneurism. This permits the clot produced by the electrolysis to come in contact with vitalized tissue from which it can become organized.

Treatment of 40 cases has convinced Mackinnon (Brit. Med. Jour., Oct. 4, 1913) that **potassium iodide** does not reduce the blood-pressure, although it often relieves pain. This can also be obtained by other means, notably by the injection of sterilized solution of **gelatin.** Gelatin does not reduce the blood-pressure, but in Rankin's and personal cases there was very marked relief of pain in almost every instance where such symptom was a prominent feature.

Macewen (Annals of Surg., Nov., 1912) commends the method of his namesake, Sir William Macewen, of introducing a fine steel needle, highly polished, into the interior of the aneurismal sac, and **scratching** very lightly the inner surface of the opposite wall, so as to produce a series of slight abrasions of that surface.

For *ruptured aneurism* of the aorta above the diaphragm, Kümmell (Beiträge z. klin. Chir., June. 1914) sutured the aorta after cutting and remodeling the artery so that it approximated the normal size. The circulation was shut off for 12 minutes by compression with the fingers and was then gradually released. The suture held perfectly and the patient was in good condition after the hour operation. It was done under **intravenous ether anesthesia,** keeping the heart action good with **saline and ether.** The previous loss of blood, however, had reduced the patient's strength so that he succumbed to gradual heart failure. The operation was done from the rear, resecting ribs (4 to 10) and pushing the unopened pleura out of the way. This affords ample access to the intrathoracic esophagus and aorta.

digitalis in, iv. 120
electrocardiogram of, v. 323
strontium iodide in, viii. 409
veratrum in, viii. 806
arteriovenous, i. 683

Symptoms, i. 683.—Among 42 cases of traumatic arteriovenous aneurism observed by Soubbotitch (Bull. de l'Acad. de méd., May 30, 1916) in the Serbian army in the last 4 years, all operated on by him, 24 were of the direct type, artery and vein being in immediate communication. The common carotid artery was involved in 3 instances; the subclavian in 1; the brachial, 2; external iliac, 3; femoral, 13; and popliteal, 2. Often no hematoma around the affected vessels was found. Symptoms generally began only a few days and sometimes 1 or 2 weeks after the injury, the most characteristic sign being an audible thrill originating at the point of communication of the vessels and transmitted centrifugally along the artery and centripetally along the vein. At operation, especially in cases of external iliac or femoral involvement, a pronounced dilatation of the vein at and above the point of communication was noticed; likewise, a narrowing of the arterial trunk below this point. Thus, a part of the blood brought by the artery, entering the vein, is transmitted by the latter, not in a peripheral, but in a central direction, toward the heart. The centripetal transmission of the thrill along the vein and the absence of peripheral varicosities are thus accounted for in these cases of direct arteriovenous aneurism.

Diagnosis.—Referring to an arteriovenous aneurism of the axillary artery, Bégouin and Moulinier (Jour. de méd. de Bordeaux, lxxxvii, 76, 1916) call attention to the following collateral sign: Examination of the collateral vessels will disclose very clear pulsations over ordinarily non-pulsatile arteries. In their case the external mammary and the subscapular arteries were distinctly pulsatile. It is an indication for intervention, and its presence suggests a favorable prognosis.

Treatment, i. 683.—In reversal of the circulation by the end-to-end method for the cure of arteriovenous aneurism, the blood returns to the heart by anastomotic venous branches a short distance below the site of operation; moreover, the arterial blood in the reversed femoral vein never reaches the foot. If the circulation is to be reversed, however, it should always be done by lateral anastomosis and not by the end-to-end method. J. .S. Horsley (Trans. So. Surg. and Gynec. Assoc., Dec., 1914; Surg., Gynec., and Obstet., Apr., 1915) uses a personally devised forceps which permits the handles to lie flat and be out of the way during suturing. In using these forceps, the vessels are first dissected down to the aneurism, and first the artery and then the vein are grasped by the forceps near their point of communication. The communication between them is then divided and the opening sutured. This makes the operation easier even when a tourniquet is applied, but it is especially valuable where no tourniquet can be used, as in the upper femoral region.

Arteriovenous aneurisms should be operated on, according to Osler (Lancet, May 8, 1915) as they offer small prospect of spontaneous cure. Up-to-date vascular surgery cannot be done in a hospital in which the younger surgeons have not full opportunities to experiment on animals, because the extraordinarily delicate technique of vascular suturing is an art acquired only after much practice. Martin (Surg., Gynec., and Obstet., Nov., 1915) reports 3 cases of arteriovenous aneurism with pulsating exophthalmos, due to trauma, and completely cured by ligation of the common carotid artery alone in 1 case, and partial ligation of this artery and some orbital veins in 2 cases.

celiac.

Giovanni (Gaz. d. osped., xxxvii, 948, 1916) gives the following previously unrecognized symptoms of celiac aneurisms: an *abnormal pulsation with a sensation of friction* rendered more distinct on applying the stethoscope about a fingerbreadth to the *right of* the *umbilicus.* The abdominal pulsation was found on operation to be due to an aneurism of the celiac artery.

cerebrospinal.

Beadle's studies, which covered 555 cases, led to the conclusion that only rarely was diagnosis of perforated aneurism of the cerebral arteries possible during life. A study of 222 cases by Wichern (Münch. med. Woch., Dec. 19, 1911), however, led him to conclude that most of these aneurisms cause both general and focal cerebral symptoms, but in some cases show evidence which differs from that afforded by tumors. Suggestive is the recurrent or exacerbatory character of the symptoms, due to successive perforations. With clear signs of repeated meningeal hemorrhages the diagnosis may be made outright. Presumption of aneurism increases with the existence of such etiological possibilities as arteriosclerosis, syphilis, and embolism. Lumbar puncture is also of diagnostic importance.

According to Jagic and Reibmay (Wein. med. Woch., Sept. 20, 1913), *lumbar puncture* is the most important factor in objective diagnosis; uniform distribution of blood in removed fluid, without the formation of clots; the same findings on repeated puncture; certain changes in the blood-cells; and, later, a change in color of the liquid will eliminate error. The clinical picture, one of repeatedly recurring meningitis, developing suddenly, sometimes in less than an hour, each attack corresponding to a small hemorrhage. Constant headache in the latent periods. The individual attack (often the first is rapidly fatal) characterized by stiffness of muscles of neck and back, pain in upper spine, nodding movements impossible, reflexes exaggerated, skin hyperesthetic, Kernig's sign, pain in occiput (all the signs of meningismus), generally no fever.

In a case of *ruptured* aneurism of the left vertebral artery observed by F. W. Weidman (Med. Rec., Mar. 27, 1915), the patient was suddenly seized with a chill, vomiting and loss of consciousness. After a time consciousness returned, but after a short interval it was again lost and opisthotonic rigidity developed. Postmortem examination showed an aneurism of the left vertebral artery which had ruptured into the cerebrospinal sac. Atheromatous changes wer present in various parts of the vascular system.

In 10 cases of aneurism of the cerebral arteries reviewed by Reinhardt (Mitteil. a. d. Grenzgeb. d. Med. u. Chir., xxvi, No. 3, 1913) the aneurisms were quite small, except in 1 case, in which a very large aneurism simulated a malignant tumor in the sella turcica; it had induced symptoms for 9 years, gradually growing more severe.

cirsoid, ii. 504

J. A. Wyeth (Med. Rec., Jan. 15, 1916) recalls the method introduced by him in 1902. **Boiling water** is injected subcutaneously into the aneurismal mass with a steel syringe, to the barrel of which a lighted candle is held to cause generation of steam. As in the case described (cirsoid aneurism of right temporal and parietal region), several sittings may be required with intervals of 2 days. The mass becomes solid and pulsation ceases.

dorsalis pedis.

E. B. Fuller (So. African Med. Rec., xiv, 135, 1916) reported a case of aneurism of this artery. Ligation above and below, and excision of the sac, which contained a considerable amount of blood-clot, brought about an uninterrupted recovery, the wound healing by first intention, even though the patient's arteries were atheromatous and a double aortic murmur was present.

embolic.

These aneurisms are comparatively common, according to O. Lindbom (Hygiea, lxxvi, No. 12, 1914), with acute endocarditis. They develop mostly in the arteries of the abdomen or limbs, and may rupture. The symptoms of internal hemorrhage then dominate the clinical picture, or there may be merely sudden violent pain with a pulsating enlargement of the artery.

external carotid.

While ligation of one external carotid may reduce the supply to the scalp, the ligation of both external carotids is considered by E. S. Judd

(St. Paul Med. Jour., xviii, 48, 1916) to be more efficacious. Ligation of the common carotid is far more dangerous, especially in the aged, and is not as efficacious as the ligation of the external carotid, as the branches involved spring from the latter vessel.

Fifty-one single ligations and 48 double ligations of the external carotid have been performed in the Rochester clinic without a single death; while in 8 cases in which one common carotid was ligated, there were 2 deaths.

idiopathic, i. 665

iliofemoral.

Case of excision of an iliofemoral aneurism in a colored man, aged 40, seen by W. S. Halsted (Jour. Amer. Med. Assoc., July 18, 1914), in which the danger of gangrene would have been extreme from any method that would suddenly cure it. He therefore made a **partial occlusion** of the external iliac with an **aluminum band.** The vessel was freed and lifted from its bed with 2 tapes between which the aluminum band was curled about it until a thrill could be distinctly felt in the artery below it. It was then again rolled tightly enough to obliterate the thrill and pulsation in the aneurism, leaving only a very faint, hardly perceptible pulse to be felt below it. The thrill proved an important guide, indicating the degree of constriction attained. About 2 weeks later the second operation of **excising** the aneurism was successfully performed and the case progressed to a cure.

secondary hematoma.

Five cases in which this form of artificial aneurism appeared from 10 days to 2 months after the original wound, were observed by J. Tissot (Presse méd., Feb. 11, 1915). A constant symptom, often preceding the local swelling, was sharp pain radiating throughout the limb and causing sleeplessness. There was pallor, but no fever—the best differential indication of hematoma from abscess. Absence of pulsation and of vascular murmur in the swelling, as well as persistence of the arterial pulse, were fairly certain indications of injury to a vein instead of to an artery.

sinus of valsalva.

Aneurism of the sinus of valsalva is more frequent than records suggest. The striking signs in one case seen by W. A. Smith (Jour. Amer. Med. Assoc., June 13, 1914), were the loud to-and-fro "saw-like" murmur and thrill, the cardiac hypertrophy, especially of the right ventricle, the precordial pulsations and the so-called "closure" sound. This last was absent in a second case. The other symptoms were mainly those of failing compensation. In the second case there was also a perforation in the pulmonary artery. In neither case was the diagnosis made before death, and this accords with all the other cases reported. In both cases death was due to myocardial degeneration and not to rupture.

splenic artery.

A case of aneurism of the splenic artery observed by Villard and Murard (Arch. Gén. de Chir., July, 1912). Both patients, a woman of 25 and a man of 33, had suffered from occasional attacks of intense pain in the left side of the abdomen, without change in the pulse or temperature. During the intervals they felt well. After 2 years in the man and 6 in the woman, an extremely long attack of the pain brought the patients to the surgeon and revealed the condition.

subclavian.

H. A. Haubold (Med. Rec., Mar. 25, 1916) recorded a case of subclavian aneurism in which return of pulsation followed ligation of the first portion of that artery.

superior mesenteric artery.

An instance of acute aneurism of this vessel with rupture, was observed in a man, aged 26, by Coterill and Miller (Brit. Med. Jour., June 5,

1915) 3 days after the onset of his illness in collapse. There was severe abdominal pain. The temperature was subnormal, the pulse irregular and thready. There was no vomiting, his bowels had not moved for three days. The abdomen was distended and showed no local dullness. There was diffuse subjective abdominal pain and no localized region of greatest tenderness. Seven hours after admission he went into severe collapse and died in half an hour. An autopsy revealed a thin-walled aneurism of the superior mesenteric artery which had ruptured into the mesentery and the peritoneal cavity.

tibial.

Where neither expansile nor non-expansile pulsation, nor aneurismal murmur, can be detected, Couteaud (Butt. de l'Acad. de Méd., Aug. 17, 1915) recommends comparison of the arterial pulse at the *root of the affected extremity* with that of the normal side. When aneurism exists, the pulsations on the affected side are less marked than on the other at the root of the limb, and grow weaker and weaker as palpation is carried down toward the injured point of the vessel.

innominate.

T. Sinclair (Brit. Med. Jour., Mar. 3, 1917) obtained a successful result in a large traumatic aneurism of the right common carotid artery in its lower portion by proximal ligature of the innominate artery after resection of 1½ inches of the inner end of the clavicle. There was no cerebral deterioration and the circulation in the arm was good, although 3 months after the operation neither the radial nor ulnar pulse was palpable at the wrist.

traumatic, i. 665

Diagnosis.—Of 50 cases of traumatic aneurism described by W. M. Eccles (Amer. Jour. Surg., xxx, 33, 1916), 30 were arterial and 20 were arteriovenous; 7 were of the vessels of the head and neck, 14 of the vessels of the upper extremity, and 29 of the vessels of the lower extremity. The popliteal suffered more frequently than any other vessel. There were 4 deaths in the series.

The signs of traumatic aneurisms vary somewhat from those of pathological aneurisms. The bruit is usually much more marked and the thrill is harsher. Where the clot is large the pulsation, bruit, and thrill may entirely disappear.

Etiology and Pathology.—In 44 aneurisms due mainly to bullet wounds observed by A. Bier (Zeitsch. f. ärztl. Fortbild., xii, 481, 1915) the time that had elapsed since the injury varied from 8 days to 3 months. The walls of the sacs were not formed by the arterial walls, but by fascia, muscle, and clotted blood. The largest was the size of a child's head, the arterial aneurisms being larger than the arteriovenous and causing more severe symptoms.

The case of a gunner in the French navy was reported by Regnault and Bourrut-Lacouture (Revue de Chir., Mar., 1913), in whom an aneurism developed of the superficial palmar arch as the result of repeated forcible slapping of the breech of a gun in order to loosen the refractory breech block. The aneurism, about the size of a hazelnut, was removed under local anesthesia with satisfactory result.

Treatment.—In the treatment of traumatic aneurisms in general W. M. Eccles (Amer. Jour. Surg., xxx, 33, 1916) makes the following suggestions: (1) Delay operation as long as possible in order to allow time for a collateral circulation to be established. (2) Always be prepared for profuse hemorrhage. (3) Make a long incision in order to secure an abundance of room.

In none of 15 cases of traumatic aneurism seen by Auvray (Bull. et mém. de la Soc. de Chir. de Paris, Apr. 20, 1915) was he satisfied with simple ligature of the vessels, and the accompanying danger of relapse.

The injuries in all were too complex and extensive to make it possible to carry out lateral suture in order to preserve the permeability of the arterial trunks. An essential condition for the performance of extirpation of arteriovenous aneurisms is to have a wide opening on to the aneurism: thus, for aneurisms in the axilla the pectoralis major was divided vertically; for aneurisms in the carotid region the sterno-mastoid was divided horizontally. These large divisions of muscle do not give rise to any serious functional trouble later if the divided ends are accurately sutured together at the end of the operation.

In 13 cases of gunshot aneurisms treated by von Haberer (Wiener klin. Woch., May 6, 1915) by suturing the injured vessels, recovery was prompt and complete in all, and there have been no complications since. This result was also obtained in 25 of 29 cases in which the vessel was ligated, in 2 amputation was required later, and 2 others died from hemorrhage from an erosion. The circulation proceeds in all the cured cases with nothing to suggest that the men are not quite normal. In 102 operations for aneurism due to war injuries, the best treatment was found by Bier (Beitr. z. klin. Chir., xcvi, 556, 1915) to be suture of the artery; it was performed in 74 cases; in most of the cases the suture was along the axis of the vessel; in only 3 cases was transverse suture performed. In arterial aneurism lateral suture was a simple operation. This was not the operation for arteriovenous aneurism. In 36 cases the wounded piece of artery was resected and the ends sutured circularly. Transplantation of a piece of vein to fill in the gap was not found necessary. Circular suture was easily performed, even on the larger arteries; intima was applied to intima and a continuous suture inserted. Small arteries were ligated. Where large veins ran through infected aneurisms, they were ligated in 2 places and resected. Death occurred in 8 of his operated cases, 4 of the fatal cases being aneurisms of the subclavian. In less than 2 months Bier (Deut. med. Woch., Jan. 28, 1915) operated in 44 cases of aneurism following a gunshot injury of a blood-vessel. The walls of the sac are formed of fascia or muscle and clotted blood, the blood still circulating in the cavity left in the center. Some of the men had severe pain in the limb, edema and contractions; others had little disturbance except that the limb tired easily. Hemorrhage and infection compelled operative treatment in some of the cases, and in all the outcome was most excellent. The hole in the artery was exposed and sutured after the blood had been expelled from the limb down to the aneurism but not below.

G. von Bonin (Beitr. z. klin. Chir., xcvii, 146, 1915) gives the histories of 12 cases of aneurism in which he sutured the vessels. One was a lateral suture of the brachial, the others were circular sutures of the common carotid, axillary, femoral, and popliteal. In 6 of the cases it was necessary to implant segments of a vein. This can be done safely if the patient's own vein is used. Generally a segment of the saphenous vein is used, and on account of the valves it should be reversed in position so that the blood runs through it in the same direction as before. Recovery was uneventful in 11 of the cases, without any infection or secondary hemorrhage. The only unsuccessful case was one of suture of the carotid, in which there was late infection from a fragment of shell that was not found and removed. The best time for operating on these aneurisms is from the third to the fifth week after the injury. The external wound should be healed, but the operation should not be delayed until a connective-tissue sac has been formed and until adhesions have developed that make it difficult to dissect the vessels away from the surrounding nerves and tissues. In the traumatic aneurisms of the extremities, H. F. O. Haberland (Deut. med. Woch., xlii, 160, 1916) considers that it is only permissible to speak of a cure when complete functional use of the organ has been restored. Early vessel-suture is favorable to early recovery. Oval suturing is to be preferred. Arteriovenous aneurisms ought always be operated upon on account of the danger of embolism.

Lannois and Patel (Lyon. chir., xii, 513, 1915) state that war injuries of the upper cervical region, including aneurisms, are very dangerous because copious hemorrhage tends to attend. Arterial hemorrhage may be controlled by **ligation** of the arteries, but the internal jugular cannot be ligated for the control of venous hemorrhage. They found that this may be accomplished by **obliterating** the **lateral sinus.** It may be approached either by the mastoid or retromastoid route. The sinus is punctured and then tamponed with gauze. The gauze can be removed on the twelfth day. No harm results from the obliteration of the sinus and hemorrhage is effectively controlled. They have applied the above method in 12 cases with success. During the Bulgarian War, according to E. Oser (Wien. klin. Woch., xxviii, 1396, 1915) the consensus of opinion among surgeons was that the best treatment was **ligation** of the affected vessels and **extirpation** or **drainage** of the sac. Since the begining of this war most surgeons have advocated suture of the vessels, but the results reported thus far have not been particularly brilliant. The technique of suture is not so difficult, but it lengthens the time of the operation and increases the danger of infection. The outcome of the operation is still more doubtful when whole pieces of vessels are transplanted.

In traumatic aneurism the best operation is considered by Quénu (Bull. et mém. Soc. de chir. de Paris, xli, 592, 1915) to be **quadruple ligation.** It may be applied even in cases where there is perforation of the carotid at the bifurcation, when quintuple ligatures are applied; none of the cases so operated upon has been lost.

Opokin (Jour. Amer. Med. Assoc.; Russky Vratch, xv, No. 14, 1916) has relatively often encountered false aneurisms during the present war, *e.g.*, in 52 per cent. of blood-vessel wounds. In about 15.2 per cent. of the cases they are caused by fragments of artillery shells. Infection prevents formation of a true aneurism. In 30.7 per cent. of the cases the aneurisms involved both vein and artery. Operative treatment should be governed not by the length of time that has elapsed since the lesion, but by the force of the arterial collateral branches, as determined by the sphygmomanometer. **Ligation** was the principal method of treatment, suturing being contra-indicated on account of the infection, infiltration of the walls of the blood vessels, presence of large cavities after removal of the accumulated blood, etc. **Excision** of the involved portion of the vessels, as near the injured portion as possible, with preliminary ligation, gave quite satisfactory results. In 76.4 per cent. of the cases of these false aneurisms and in 100 per cent. of the arteriovenous variety, the patients recovered.

A. Bier (Zeitsch. f. ärztl. Fortbild., xii, 481, 1915) does not extirpate the sac, as was formerly done, because this sacrifices too many collateral branches. He finds the hole in the artery and performs **ligation** above and below it so as to spare all branches, and removes the injured piece of artery. This he did in 14 cases. In the other 30 cases the arteries were **sutured.** The circulation was always cut off with a bandage or rubber tube before the operation was performed.

In 425 reported cases of aneurisms during the Balkan War and the present war so far as Zahradnicky (Wein. klin. Woch., xxviii, 999,

1915) has been able to ascertain, **ligation** was used in 242, and 182 were treated by **suture** of the arteries. Among the 242 treated by ligation, gangrene developed in 28, or 11.5 per cent., and necessitated amputation. Among the 182 cases treated by suture, gangrene made amputation necessary in 7, or 3.7 per cent. The mortality by the 2 methods was about the same, 7.4 and 7.1 per cent. But the figures show that ligation is followed by gangrene 3 times as often as suture of the vessels. Still better results were obtained with suture when operation was performed early, *i.e.,* before adhesions have formed, and when there is not so great a tendency to thrombosis. Ligation should be reserved, he holds, for severe cases of sepsis or anemia, where operation is necessary to save life, or for cases where the collateral circulation is already established and suture is unnecessary.

The available collateral circulation should determine whether an aneurism is to be treated by ligation of the afferent and efferent vessels, extirpation of the sac, or aneurysmorraphy, and also whether a large injured vessel should be merely ligated or sutured. In cases of aneurism due to military injuries H. Coenen (Zentralbl. f. Chir., Dec., 1913) uses the following method: Without interrupting the circulation, as by an Esmarch bandage, the aneurismal sac is freely dissected out and the artery **ligated both above and below,** close to the sac, which is thus completely excluded from the arterial circulation. Beneath the peripheral ligature a clamp is applied and the artery divided between it and the ligature. If on loosening the clamp bright red blood escapes from the peripheral stump, this is an indication that sufficient collateral circulation has been established and the ligature may be safely applied. If, however, there is no flow of blood, this points to an undeveloped collateral circulation, and arterial **suture** or **anastomosis** with a vein is indicated.

H. Schwieker (Deut. Zeit. f. Chir., cxxxvi, Nu. 6, 1916) reports 17 cases of war aneurisms, femoral, tibial, popliteal, subclavian, common carotid and external carotid, and states that while suture of the injured vessel is the most important aim; yet owing to the much torn vessel wall suture is often technically impossible. In such cases there need be no fear of a complete **ligation** of the involved vessels.

arterial compression in, i. 677
arterial ligature in, i. 677
calcium chloride in, i. 676, 677
calcium lactate in, ii. 717
coils of wire in, i. 678
collodion in, i. 675
diet in, i. 675, 677
digital pressure in, i. 678
Dix's operation in, i. 678
electric needles in, i. 678
electrolysis in, i. 681
endoaneurismorrhaphy in, i. 679

To *lessen the dangers of gangrene* after operation for aneurism, L. Moszkowicz (Beit. z. klin. Chir., xcvii, 569, 1915) resorts to the following method: The limb is made anemic by inhibiting the entire circulation below the aneurism for 2 minutes by means of a constrictor, then releasing the constriction and compressing the artery above the aneurism. If an active hyperemic reaction is obtained the collateral circulation is sufficient.

ergot in, iv. 572
Esmarch bandage in, i. 677
excision of sac and implantation in, i. 679
forced flexion in, i. 677
galvanic current in, i. 691

According to Valladares (Brazil Medico, Nov. 8, 1914), the efficiency of the Brazilian treatment by application of the positive pole of a continuous or galvanic current, which has a coagulating action, is enhanced by employing electrodes of the same size and as large as the aneurism to be treated.

Aneurism (*continued*).
gelatin in, i. 676; v. 14
gold wire in, i. 681
horse serum in, i. 677
ligation in, i. 678
Macewen's acupuncture in, i. 681
Matas method in, i. 679, 680
metallic rings or clips in, i. 681
milk diet in, i. 677
Moore-Corrady method in, i. 681
Moore's method in, i. 681
nitroglycerin in, i. 677
potassium iodide in, i. 675, 676; vi. 25
repeated concussions over seventh cervical vertebra in, i. 682
rest in, i. 675, 677
sodium nitrite in, i. 677
theobromine in, i. 677
varicose, i. 683
Aneurismal varix, i. 683
Angina abdominis, **diuretin in**, iv. 335
Ludwig's, see Ludwig's Angina, vii. 428; also this Index.
Vincent's, see Vincent's Angina, vii. 428; also this Index.
Angina pectoris, i. 684

Diagnosis, i. 686.—In cases in which angina pectoris is suspected, J. E. Talley (Med. Rec., Nov. 6, 1915) considers that *the less found wrong with the heart* upon examination, *the more certain* may one be of *the diagnosis.* In a series of 500 cardiovascular and cardiorenal cases there were 35 cases of genuine angina pectoris. One-third had succumbed to an acute anginal attack, and two-thirds to gradual cardiac death.

The cases may be divided into two groups: the *angina of effort* and the *angina of decubitus,* but in the later stages of either form of the disease the distinction becomes less clearly marked, and either form may rapidly be followed by the other. In determining what organic lesions may be present, very great importance is attached by H. Vaquez (Arch. des mal. du coeur, Mar.-Apr., 1915) to the results of *radioscopic examination.* As a rule, in the angina of effort, aortitis is present. The qualitative changes shown by radioscopy are diminution of transparency of the walls of the aorta, which on the screen look either uniformly dark or sown with scattered dark patches. Very often there is more or less complete immobility of the vascular contours, indicating loss of elasticity in the vessel walls. Radioscopy may also reveal modifications in volume whose detection has escaped ordinary methods of observation. One change of much significance in the diagnosis of the epigastralgic form of the disease is *enlargement of the aortic arch.*

There are two distinct types of true cardiac pain, according to R. N. Willson (Med. Rec., Nov. 6, 1915)—the *dull heavy pain of distension* and dilatation, and the *sharp cutting pain of aortic* valve and aortic *disease.* There is no such entity as pseudo-angina pectoris. The cardiac nervous mechanism shows definite signs of disease, and here will be found the real seat of angina.

Case reported by De Blasi (Gaz. degli Osped., May 30, 1915) in which the attacks of pain were in the gastric region with developing ectasia of the aorta in the course of mild and chronic kidney disease, the man being a hearty eater and smoker. The *gastric pain* spread vaguely toward the heart and the pulse became small, while the pallor was extreme as the man writhed under the supposed "gastralgia."

An *erythema* not described so far, appears just as the crisis of angina is reached, over the face, chest, and front of the neck. In a case described by Gilbert and Descomps (Paris méd., Mar. 23, 1912), it began with a diffuse redness, extending over face, neck, and front and back of the thorax. Smaller and redder spots then became visible, which grouped themselves into islets; this latter appearance coinciding with the disappearance of pain and the usual feeling of well-being. It is notable that this phenomenon is similar to that produced by inhalation of amyl nitrite.

Solomon Solis-Cohen (Med. Rec., Nov. 6, 1915) observed many cases of so-called *pseudoangina* in which the pain occurred without structural lesions in the myocardium coronary arteries, or the aorta, in which upon proper recognition and treatment the pain had disappeared and the patient lived, as in one case under his observation at the time, for more than twenty-five years.

In a clinical study of 200 cases, J. B. Herrick and F. R. Nuzum (Trans. Amer. Med. Assoc.; N. Y. Med. Jour., June 16, 1917) found that the most frequent exciting cause of seizures was overexertion, though walking, eating heartily, and emotional outbursts had also their etiological place. A sense of *constriction without pain* occurring after the ordinarily exciting causes was always *highly suggestive.* A striking fact is the frequency with which patients remain unwarned by experience of the dangers of carelessness. A large proportion of patients with embolic or thrombotic obstruction of a large branch of a coronary artery have died suddenly soon after the accident, and yet at autopsy pathologists have found evidence of long-standing obstruction. So it is obvious that occasionally a coronary obstruction may cause an anginal seizure, and yet the patient does not die immediately or even soon.

Etiology, i. 689.—An analysis of 178 cases by Bramwell (Edinburgh Med. Jour., Dec., 1915), showed that the great majority of them occurred between the ages of 55 and 64. In 26 per cent. no definite lesion was detected either in the heart or in the aorta. In 24 per cent. there was a valvular lesion, and in 25 per cent. there were aortic dilatation and aneurism.

The angina pectoris following overexertion is merely a primary dilatation of the left heart when the heart has been "forced." Tobacco can only evoke an attack with hitherto latent organic trouble, according to H. Vaquez (Arch des Mal du Coeur, Mar.-Apr., 1915), but is not capable of inducing the latter. Huchard found a history of syphilis in 35 of 150 cases of angina pectoris and the author in 30 of 100, and this before the Wassermann reaction was known.

Angina from tobacco can indeed be agonizing, but it always ceases with the withdrawal of the narcotic; where the angina persists despite this withdrawal, it is necessary to make a Wassermann test for syphilis. Three cases reported by C. Feissinger (Semaine méd., Apr. 2, 1913), in which a positive reaction indicated the proper mercurial treatment, which was followed by immediate relief after other measures had proved inert. A case is reported by Mouriquand and Bouchut (Arch. des Mal. du Coeur, Oct., 1912) in a man of 34, who developed attacks of angina pectoris and died in 5 months. There was no trace of venereal disease or alcoholism, but signs of tobacco poisoning had been so pronounced that his daily ration of cigars and cigarettes was reduced. The case would have been cited as one of fatal tobacco poisoning but necropsy revealed syphilitic lesions in the aorta partly closing up the openings into the coronary arteries.

A case was reported by Schott (Deut. med. Woch., July 15, 1915) in a soldier in whom angina pectoris developed with the nervous-trophic and vasomotor phenomena of Raynaud's disease—the whole probably to be ascribed to chronic intoxication of a chemical nature from inhaling nitrite dust in handling explosive powders.

Pathology, i. 690.—Hering (Münch. med. Woch., Nov. 2, 1915) states that Heberden—who introduced the name of angina pectoris for the affection—declared in 1768 that its most common termination is sudden death. This holds good today, yet we are unable to state the rationale. In 1889 McWilliam advanced the belief that in many cases of sudden death a myocardial fibrillation could be invoked as the efficient cause; but only recently have animal experiments given some corroboration to this view. Sudden death in angina pectoris is considered by the writer to be the result of ventricular fibrillation, but the direct actual proof can be supplied only by electrocardiography. The patient does not die from paralysis of the heart but from the direct opposite, the excessive production of impulses. We already have data which shows that angina pectoris occurs only when there is temporary ischemia of the heart, and we know by experiments on animals that this ischemia is liable to precipitate fibrillation of the ventricles, and also that the ischemia predisposes the heart to fibrillation. All cases of angina pectoris G. O. Jarvis (Monthly Cyclo. and Med. Bull., Mar., 1914) has examined showed marked dilatation of the heart and aorta, with auricular fibrillation. The pain of anginal paroxysms is due to overdistension.

According to Mackenzie, angina pectoris, is an evidence of an exhaustion of the function of contractility, the pain and reflex muscular contraction being reflex phenomena due solely to an impairment of the contractile function of the heart. This does not, however, explain the entire situation, for W. J. Pulley (N. Y. Med. Jour., Nov. 8, 1913) believes there must of necessity be present with it a great distress of the function of tonicity, if not a beginning impairment. The pains are protective, by causing the patient to cease muscular efforts, and tend to rest the heart. The fear also is protective by causing the patient temporarily to cease worries and excesses of all kinds. The flushed face, due to reflex stimulation of the vasodilators of the superficial capillaries, also tends to reduce vascular supertension. The contraction of the intercostal muscles is also protective; it prevents deep breathing, which increases the arterial tension, and provides a splint to protect the already stretched and weakened aortic walls.

The essential element in angina pectoris, according to Richard Stein (Med. Rec., July 24, 1915), lies in the irritation of the nervous system. There is no organ richer in nerve fibers than the heart. It contains sensory nervous filaments; and a cardiac angina, in the true sense, is therefore not only possible, but probable. The cardiovascular system is under the direct control, from within and from without, of the vasomotor system, and the latter reacts upon the sympathetic directly, as well as by reflex, and *vice versa*. Abdominal and cerebral anginas originate in the same way.

Castelli (Riv. crit. di clin. med., Dec. 6, 1913) does not deny all significance to the prevailing doctrine of coronary sclerosis, but its meaning has hitherto been virtually negative. The hypothesis of Mackenzie is untenable. Angina pectoris does not mean a want of muscular strength, of contractility, but the result of "brusque hypertension in the left ventricle, both systolic and diastolic from the increased tone, together with an unregulated and disordered excitability" of the "primitive fascia and of the cardiac nerves."

Angina pectoris is a syndrome connected with many different states, but the one condition found present by De Lancey Rochester (Med. Rec., July 25, 1914) with all attacks was the interference with the function of contractility of the myocardium. There is no standard of blood-pressure; what was high for one individual was low for another. The treatment must be of the individual and not of the symptoms.

Treatment, i. 695.—S. Neuhof (Med. Record, Jan. 15, 1916) states that the frequent and indiscriminate use of such terms as false angina pectoris, angina sine dolore, angina vasomotor, etc., gives no clear sense of their etiology or pathology. He therefore discusses precordial pains under the following headings:—

Hypertensive Cardiovascular Disease with Myocardial Insufficiency.—In this group the usual cardiac changes are ventricular hypertrophy, usually left, but sometimes right also; a patchy fibrous myocarditis; thickened aortal and mitral cusps; lime deposits on the first portion of the aorta and atheroma and thickening of both coronaries. There is a systolic blood-pressure of about 190 mm.; rough systolic first and sharply accentuated second sound at the right base; heaving apical impulse; urine with or without albumin or casts; varying grades of edema and visceral congestion; dyspnea usually upon excretion. The pains are commonly dull, most marked in the precordium and radiate to the neck and arms. As to the cause of the pain, it seems to be due to nutritional cardiac disturbance from inadequate coronary circulation. The author depends mainly on **digitalis**, preferably the tincture, given in 15-minim (1 c.c.) doses 3 times a day, continued even when pain and other symptoms disappear, for an indefinite period. Mental excitement and stress should be avoided. For the edema, **theobromin sodium salicylate** in 1-gram (15-grain) doses *t. i. d.*, on alternate days in water or in wafers are recommended. The **Carrel diet** was an excellent aid. In cases in which a luetic condition is proved or suspected the **iodides** are useful, otherwise they proved of no value in the relief of the pain.

Hypertension and Myocardial Insufficiency with Unstable Vasomotor Mechanism.—This is a smaller group with the highest systolic blood-pressure, around 180, and marked diurnal variations, precordial pains following exercise. Emphysema and myocarditis are the main pathological entities. Experimental subcutaneous injections of **nitroglycerin** in doses of 1/50 grain (0.0013 Gm.) *t. i. d.*, has a marked temporary effect upon the blood-pressure and usually upon the symptoms. This or other vasodilators given at the onset of pain are likely to give great relief. Digitalis was not as beneficial as in Group 1.

Uremic Group.—This group is characterized by headache, nausea, vomiting, varying grades of anemia, paroxysmal dyspnea, precordial distress, high systolic and diastolic pressure, nocturnal polyuria, and changes in the retina. The precordial pains are not relieved by nitroglycerin, digitalis, or diuretin. The pains are apparently caused by retained excrementitious products in the circulation. Dietetic measures, especially **low protein and high carbohydrates**, are of most value.

Acute Rheumatic Endocarditis and Rheumatic Endocarditic Exacerbations.—These cases usually occur in young persons with mild tachycardia, no dyspnea or decompensation, and with marked auscultatory evidence of valvular disease, usually mitral stenosis. There were "sticking" pains in the heart itself, and usually, no Head's zones. The rapid heart action and the precordial pain seem due to fresh exacerbations of endocarditis. The best medication is **sodium salicylate** in 1-Gm. (15-grain) doses hourly until 6 doses have been taken or tinnitus occurs. **Bromides** in moderate doses are helpful; absolute rest is necessary.

General Circulatory Failure and Decompensation from Endomyocardial Disease.—The cause of the precordial pain is apparently the nutritional disturbance in the heart, due to circulatory failure. Head's zones are often present. The treatment indicated for the first group is also indicated here.

Embolic Infarcts in the Main Coronaries and Their Branches.—In several cases with intermittent pains lasting days or weeks, the symptoms were possibly caused by embolic infarcts of the coronaries of the second or third order. There was a rise of temperature, acute endocarditis, propressive tendency of the disease, and tender local precordial areas.

Cardiac Lues.—This is a very frequent cause of precordial pain. The latter is usually substernal, dull, boring, and aching. It may, however, have the distribution of the types already described. Head's zones are rare. The main pathological changes occur in the aorta and myocardium. **Salvarsan** combined with the usual **mixed treatment** is of great value.

Premature Arteriosclerosis.—This rare group found in young adults, is characterized by persistent precordial distress, lasting often for months. Gastric symptoms similar to those of hyperacidity may predominate. Physical examination affords no hint of the severity of the pathological process. The cause for the sclerosis is still undetermined, but it may be the result of some infection and toxemia. Except **digitalis** for temporary relief, treatment is of no avail.

Tabacism.—The pains may be dull and aching, or sharp and radiating. The first premonition may be very sharp lancinating precordial pains radiating to the left shoulder and forearm and accompanied by unconsciousness. Most tobacco pains and arrhythmias cease when smoking is stopped. Occasionally they recur. **Nitroglycerin** given regularly or with the onset of pains is sometimes of benefit.

alcohol in, i. 696
alkalies in, i. 697
ammonia (aromatic spirit) in, i. 696
amyl-nitrite in, i. 695, 696, 698; vii. 54
apomorphine in, ii. 67
arsenic in, i. 697
artificial respiration in, i. 696
asafetida in, i. 698
aspirin in, i. 696
atropine in, i. 696
barium chloride in, i. 697
blood-pressure in, iii. 493
bromides in, i. 698
cactus grandiflorus in, ii. 708
caffeine in, i. 696
camphor in, i. 696
carbonic acid in, i. 698
chloroform in, i. 695, 698

There is a class of cases of angina pectoris in which the administration of chloroform is considered by Verdon (Brit. Med. Jour., Aug. 9, 1913) to be attended by considerable risk. An opinion prevails in the profession that during the anginal seizure the arteries are in a state of vasoconstriction, that peripheral resistance is increased and blood-pressure is raised, consequently that the employment of a drug which causes rapid vasodilatation in the splanchnic region is indicated. On several occasions, however, the writer has found blood-pressure lowered, falling 20 to 30 mm. Hg. below the normal. This must mean vasodilated splanchnic vessels. Such patients appear to be in a state of shock; the pulse is stringy and soft, hard or compressible, frequent or slow. The venous system, so far as surface veins indicate its state, is drained of blood. The skin is pallid, cold, and covered with sweat. In subjects belonging to this class, administration of chloroform is attended by considerable danger. This is further emphasized by the fact that all cases of angina pectoris G. O. Jarvis (Monthly Cyclo. and Med. Bull., Mar., 1914) has examined showed marked dilatation of the heart and aorta, with auricular fibrillation. The pain of anginal paroxysms is due to overdistension of the heart, for the pain was observed to end with the distension. The blood-pressure is high at the beginning of an attack, but sometimes drops to less than 100 mm. Hg. at its close. During the attack there are marked variations in the blood-pressure, according as the heart is gaining or losing in its struggle to compensate. Heart block and irregular heart were found in all cases examined.

digitalin in, i. 696, 697

The drugs of the most service are considered by Saundby (Clinical Jour., May 21, 1913) to be digitalis or Nativelle's **digitalin** or gr. $\frac{1}{300}$ (0.0002 Gm.) of Merck's **strophanthin** 3 times a day. During the attacks **trinitrin** in 2-minim (0.12 c.c.) doses dissolved in water is better than nitrite of amyl. Two or three doses of trinitrin can be carried in the waistcoat pocket in separate small bottles.

digitalis in, i. 695, 698; iv. 156

Shattuck (Boston Med. and Surg. Jour., Aug. 26, 1915) believes that **digitalis** is indicated only so far as myocardial failure is suggested by symptoms other than pain. Small doses of **potassium iodide** can seldom be harmful and seem to be of value even in non-syphilitic cases. The action of **glonoin** is so transitory that its value between attacks is doubtful.

Where the nitrites fail to be of service, or where the blood-pressure is low and a tendency to cardiac dilatation is suspected, Oppenheim (Prog. méd., Feb. 3, 1912) prescribes **digitalis**, as, for example, a mixture of 3 c.c. (48 minims) of a 1 to 1000 solution of French **digitalin** with 50 Gm. (1⅔ ounces) of water; dose, 1 teaspoonful daily. This may be continued for a week, then intermitted for 10 days, then resumed, etc., the periods of intermission being gradually lengthened.

Simultaneously with nitrites or digitalis, some sedative preparation should be administered, *e.g.*:—

℞ *Heroinæ hydrochloridi* . 0.02 Gm. (⅓ gr.).
Syrupi aurantii florum ..... 30.00 Gm. (1 oz.).
Aquæ destillatæ, q. s. ad. 150.00 Gm. (5 oz.).

M. Sig.: Three to four tablespoonfuls daily.

diuretin in, i. 696; iv. 334, 335
electricity in, i. 696

Sinclair Tousey (N. Y. Med. Jour., May 8, 1915) claims to treat angina pectoris successfully by **high frequency currents** from ultraviolet ray vacuum electrodes, and by **vibration.** A glass vacuum electrode exhausted to the ultraviolet degree was used and high frequency currents from an Oudin resonator applied to the front and back of the chest for about 5 minutes each; and a vibrator was passed over the abdomen along the course of the colon for about 2 minutes. The high frequency current was strong enough slightly to redden the skin toward the end of the treatment. Each successive application was the same and no medicine or diet was prescribed, except that on 2 occasions a local application of radium was made for the cure of a recurrence of supposedly malignant tumor of the left breast excised some years previously. This recurrent tumor disappeared after these 2 treatments.

The electrical and vibratory treatment was given on an average of twice a week.

H. H. Seelye, in a letter to the New York Medical Journal, May 22, 1915, states that he had also treated 2 cases successfully for angina pectoris by this same method. Ten or a dozen treatments had removed all symptoms at first, so they felt cured. Within a year the treatments having been stopped contrary to advice, both patients had sharp recurrences and were too ill to come for further treatments, and so died within a few days. This indicates the need of resuming the treatments at occasional intervals.

erythrol tetranitrate in, i. 695; iv. 600
ether in, i. 695
farinaceous foods in, i. 697
friction in, i. 696, 698
glyceryl trinitrate spirit in, i. 695
heat in, i. 698
high-frequency current in, i. 696
ice-bag in, i. 696
lactic acid bacillus in, i. 696
laxatives in, i. 697
local heat in, i. 696
magnesium oxide and peroxide in, i. 697
massage in, i. 698

A mechanical method of relief is recommended by Samuel Constable (Lancet, Apr. 29, 1916). The patient grasps the top bar of the bed with both hands, letting most of his weight fall on the now strongly stretched arms for some 40 seconds. After a short rest the process is repeated some 5 or 6 times. Immediate cessation of all pain in arms and some relief of the chest ensues. Then, rising, he grasps the bar at the end of the bed with both hands behind his back, bending forward at an angle of about 60 degrees, the chest thrown forward, and the head back, thus subjecting the muscles of the affected area to strong tension. This is repeated some half dozen times, each lasting about 40 or 50 seconds. This is followed at once by cessation of all pain in the chest, the sense of constriction completely vanishing.

The most rapid and efficient method of treatment according to G. O. Jarvis (Mthly. Cyclo. and Med. Bull., Mar., 1914), is **concussion at the level of the seventh cervical vertebra** in conjunction with the use of some drug, such as **pilocarpine** (1/10 grain—0.006 Gm.—hypodermically), to aid in the increase of vagus tone. In a case referred to, the concussion at the seventh cervical vertebra reduced the diameter of the heart by 5 cm. on 2 separate occasions, and brought relief from pain in about 10 minutes.

methylene blue in, i. 698

milk diet in, i. 697

Soca (Arch. d. mal. du Coeur, Aug., 1915) has long been convinced that the absorption of toxic products during metabolism is an etiologic factor of importance in the pathogenesis of all functional troubles of the heart and of the aorta. In 123 anginal patients, 80 of whom have been followed for a sufficient time to warrant therapeutic conclusions, dietetic treatment intended to avoid toxemia was used. The first day, the patient having angina pectoris attacks is given nothing but **water**. On the second day **milk** is given in quantities varying from 1½ to 3 quarts. Nothing but milk is allowed for from 1 to 3 weeks, according to the severity of the case and the response to treatment. In the milder cases, at the end of a week, soups made of milk and various kinds of **cereals** are added and continued for 1 or 2 weeks. At the end of this time cooked vegetables without salt are added and continued for a month or two. Then eggs and a small amount of meat are allowed. Milk still remains the basis of the diet, and no salt is added to the food. This remains the permanent diet, except that it is discontinued for 1 week each month, during which time milk alone is taken. If attacks recur, the milk diet is resumed at once. Some diuretic was always given, such as theobromin salt. **Absolute rest** was not found to be necessary in any but the severest cases. Moderate exercise, including walking, was allowed, but insistence was laid on the avoidance of hasty exertion. At the end of the first week of this treatment, or before that time, pain had invariably been diminished or had stopped. Twenty per cent. of the cases showed no further amelioration. In the others (80 per cent.) there was decided amelioration, and in more than half of the cases there was relative or absolute cure, as shown by freedom from attacks even after exertion.

In cases of angina pectoris in which the tension rises during the attack L. Brunton (Lancet, July 24, 1915) advises to keep it low by **abstaining entirely from butcher meat and strong soups**, to be sparing of **alcohol** and to **abstain from severe exertion** of body or mind.

morphine in, i. 695, 696, 697, 698; vii. 188

Theobromin is as reliable in angina pectoris as digitalis is when the heart action is rapid and weak. In a pronounced attack H. Kohn (Berl. klin. Woch., May 17, 1915) finds that **morphine** relieves the pain and relaxes the spasmodic contraction of the coronary arteries. The dose must be 0.01 Gm. (⅙ grain) at least, repeated if improvement does not soon follow. If one already knows the patient, 0.015 or 0.02 Gm. (¼ to ⅓ grain) might be given to start with. If the pulse is slow or growing slower, stimulants should be injected at the same time, not waiting for signs of pulmonary edema to develop, repeating the **camphor** or **caffeine** as needed.

mustard poultice in, i. 696
nitroglycerin in, i. 695, 697; vii. 54, 55, 57

When anginal attacks follow each other in close succession, as may be the case when the angina is of aortic or renal origin, or due to chronic tobacco intoxication, or associated with aerophagia, the treatment should aim not only to relieve pain, but also to obviate myocardial fatigue. C. Fiessinger (Bull. de l'Acad. de méd., Oct. 7, 1913) recommends the use of **morphine**, subcutaneously, in doses of 1/30 grain (0.002 Gm.) every 3 hours rather than in larger amount. Two to 4 drops of **nitroglycerin** solution or inhalations of **amyl nitrite** (not over 2 or 3 times a day) may be administered during the intervals. An **icebag** should be kept over the heart and the diet cut down to 1 pint or slightly more (500 to 600 Gm.) of milk, mixed with an equal volume of water. Absolute immobility having been enjoined, the recurring paroxysms will tend to disappear in from a few hours to three or four days.

Munson (Ill. Med. Jour., Nov., 1916) found that while amyl nitrite and nitroglycerine were of service, **morphine** ⅛ grain (0.007 Gm.), *p. r. n.*, was preferable; he gives also **atropine** especially if there is cardiac ischemia from coronary involvement. **Hot applications** to the precordia, with **hot drinks** are helpful.

When the paroxysms are frequent, Oppenheim (Prog. méd., Feb. 3, 1912) advises **absolute rest in bed**, limits the diet to 1.5 or 2 liters (quarts) of milk a day, a small cupful every 2 hours. If hot compresses prove inefficient, he applies an icebag. **Nitrites** should be administered in either of the following forms:—

℞ *Spiritus glycerylis nitratis* gtt. xx.
Syrupi aurantii 30 Gm. (1 oz.).
Aquæ aurantii florum ..... 10 Gm. (2½ dr.).
Aquæ destillatæ, q. s. ad. 150 Gm. (5 oz.).
M. Sig.: One tablespoonful three times a day.

℞ *Sodii nitritis* .. 1 Gm. (15 gr.).
Syrupi aurantii 25 Gm. (6¼ dr.).
Aquæ destillatæ, q. s. ad. 150 Gm. (5 oz.).
M. Sig.: One desertspoonful three times a day.

There is one kind of angina associated with, and depending on organic disease of the heart, according to R. H. Babcock (N. Y. Med. Jour., May 6, 1916), and another which, so far as physical examination can determine, is independent of cardiac disease. The management of the two is different, just as the prognosis is different. Those cases are most quickly and completely relieved by **nitrites** in which vascular spasm seems present, as shown by pallor of countenance and coldness of the extremities. Some German writers, notably von Leyden, have considered the continued use of the nitrites detrimental, and their objection would hold especially with regard to the regular daily employment of this valuable class of remedies. As the writer takes it, the use of the nitrites should be limited to the relief of the anginal attack itself, and even then some caution should be observed. Fortunately, the seizure is usually of rather brief duration and yields to the inhalation of a single 3-minim (0:18 c.c.) pearl of **amyl nitrite** or to 1 or 2 tablets of 1/100 grain (0.00065 Gm.) of **nitroglycerin** dissolved on the tongue. But should the attack prove unusually intractable or should a status anginosus occur, then **morphine** and **atropine** hypodermically should be employed, freely if necessary. Should this not relieve, other **stimulants**, such as camphor, ammonia, caffeine, and even digitalis, should be resorted to.

The aim of treatment should be to strengthen the myocardium so as to enable the individual to exercise or bear physical disturbances without the induction thereby of angina. Digitalis, and in particular amorphous strophanthin in 0.0005-Gm. (1/120-grain) doses 3 or 4 times daily, have likewise proved useful.

Valuable adjuvants are medical gymnastics. Massage may be of limited service. Hydrotherapy, salt rubs and Nauheim baths are likewise of benefit when properly employed. Much attention should be paid to the diet and to the state of the bowels.

Those offering some prospect of permanent benefit from treatment appear to be such as present the following physical signs: Moderate stiffness of the peripheral vessels, with or without abnormally high blood-pressure, hypertrophic dilatation of the heart, a mitral systolic murmur of muscular incompetence, and often a harsh systolic bruit in the aortic area. As pointed out by the late John Musser, their angina diminishes or disappears as endocardiac pressure becomes diminished.

nitrous ether spirit in, i. 698
opium in, vii. 188
oxygen in, i. 696, 697, 698
phosphorus in, i. 697; vii. 455
potassium iodide in, i. 697; vi. 25
prolonged rest in bed in, i. 697
quinine in, i. 698
reduction of food in, i. 696
rest in, i. 695, 697

C. L. Greene (Jour. Amer. Med. Assoc., July 19, 1913) considers that the therapy should be based on the chief causative factor—the cardiac exhaustion. The efficient treatment of cardiac pain in the broader sense resolves itself into the management of an insufficient, overfatigued heart muscle. Mental and physical rest and regulated exercise offer the best means of restoring a proper circulatory balance.

Angina pectoris (*continued*).
rubefacients in, i. 698
saline baths in, i. 698
Schott exercises in, i. 698
sodium iodide in, i. 696; vi. 25
sodium nitrite in, i. 697
sparteine in, i. 698
strophanthus in, i. 698; viii. 412
strophanthus in, i. 698; viii. 412
strychnine in, i. 696, 698
theobromine in, i. 696, 697
tonics in, i. 698
valerian (ammoniated tincture) in, i. 698
pectoris accompanying myxedema, thyroid gland in, i. 725
epileptiform, zinc oxide in, viii. 836
pseudo-, antipyrin in, ii. 43
Vincent's, see Vincent's Angina, vii. 428; also this Index.
Angiocholitis, vi. 424
silver nitrate in, viii. 135
Angioid streaks in retina, vii. 201
Angioleucitis, see Lymphangitis, viii. 541
Angiomata, ii. 502

Pathology.—Two cases of primary tumors of vascular sheaths are reported by V. Marcozzi (Riforma Medica, July 17, 1915), one of a small-celled fibrosarcoma arising from the sheath of the left femoral artery and the other a fibromyxosarcoma of the left external carotid. These tumors may be easily confounded with those of organs adjacent to the blood-vessels, and it should be based on the situation, the mobility, and the relations. Some authorities hold that a true vessel sheath tumor should show no adhesions to the surrounding tissues and should be easily enucleated. But in the writer's cases, one tumor being in the neck and the other at the root of the thigh, both were sarcomatous, adherent to the neighboring artery and other tissues. Each, however, was successfully removed.

adrenalin solution in, ii. 542
alcohol injections in, ii. 535, 545
alum powder (Squibb's compound) in, ii. 546
amputation in, ii. 545
arsenic in, ii. 529

Angiomata (*continued*).
  B-eucaine in, ii. 542
  boiling-water injections in, ii. 535

Wyeth's method of treatment of angiomata by injections of boiling water, according to F. Reder (Jour. Amer. Med. Assoc., Jan. 30, 1915), had no failures in a series of 26 cases. In every instance the results have been gratifying. Most of the lesions were on the face and scalp. Four patients had angiomata on the tongue, ranging from the size of a filbert to that of an English walnut. One had the lesion on the left gluteal region as large as a cocoanut; another patient presented a fusiform angiomatous growth on the right middle finger between the second phalangeal articulation and the knuckle, which tumor caused great pain.

  buried ligatures in, ii. 545
  carbolic acid in, ii. 529, 534
  carbon dioxide "snow" in, ii. 531, 532, 545

D. Friedlander (Amer. Jour. of Dermat., May, 1912) urges the value of carbon dioxide snow in the treatment of vascular growths of the skin.

While liquid air undoubtedly does all that carbon dioxide snow can do, and attains its effect more rapidly, due to its temperature of 180° C., it is commercially unobtainable, hard to preserve, costly, difficult to apply to small areas, and considerable skill and practice are necessary to limit it to the diseased part. As regards carbon dioxide snow, on the other hand, the apparatus and material for preparing, collecting and applying, can be always at hand, and the preparation involves only a few minutes, and the cost is exceedingly small. It is bloodless, comparatively painless, rapid and the number of treatments are exceedingly few; and, while its temperature is not as low as, and its action somewhat slower than liquid air, it avoids all danger of a slough and the amount of pressure can be definitely regulated. Furthermore, there is no difficulty in confining the treatment within the borders of the lesion, and, finally, the cosmetic result, a fine, white, pliable, smooth, hardly visible scar, is not equaled by any other method.

The immediate result of the application of the snow is a contraction of the blood-vessels, the skin being white, depressed and of marble-like hardness, the depth of which varies from 1/32 to 1/8 of an inch, according to the duration of the application and the amount of pressure applied, and this is soon followed by a rapid dilation of the vessels and erythema. In 2 to 24 hours a vesicle forms, accompanied by a certain amount of edema, which is followed, in turn, by the formation of a crust within 2 to 3 days. This crust separates, without ulceration or hemorrhage, in 9 to 14 days, leaving a smooth scar of practically normal color.

  caustic pastes in, ii. 529
  chloral hydrate in, ii. 534
  chromic acid in, ii. 529
  collodion in, ii. 529, 545
  collodion (bichloride) in, ii. 545
  compression method in, ii. 528
  corrosive sublimate in, ii. 529, 530
  electrocataphoresis in, ii. 533
  electrolysis in, ii. 533, 534, 545
  electropuncture in, ii. 533
  electrothermic cautery in, ii. 533
  excision in, ii. 541, 545
  ferripyrine in, ii. 546
  Finsen light in, ii. 536
  freezing in, ii. 531; vii. 786
  fulguration in, iv. 428
  fuming nitric acid in, ii. 529, 530
  galvanocautery in, ii. 529
  high-frequency current in, ii. 534
  hot air in, ii. 533
  hydrogen peroxide injections in, ii. 535
  ichthyol in, ii. 529, 545
  ignipuncture in, ii. 533
  interstitial cauterization in, ii. 533
  iron sesquichloride in, i. 534
  Korte's method of extirpation in, ii. 543
  ligation of large afferent trunks in, ii. 541

In extensive angiomata of the face, Morestin (Revue de Chirurgie, Feb., 1914) ligates the afferent vessels and injects formaldehyde. His results were extremely satisfactory in 4 cases of extensive, diffuse or pulsating angiomas disfiguring women. Both arteries and veins are ligated through an incision in a fold of skin in the neck. The external carotid and then each of its branches in turn, especially the superior thyroid, the facial and the lingual were all ligated when necessary. General anesthesia is necessary for the ligation of the vessels and the injections.

ligatures in, ii. 540
liquid air in, ii. 531, 545
magnesium darts in, ii. 535, 545
mechanical compression in, ii. 543, 546
mercuric cataphoresis in, ii. 533
novocaine in, ii. 542
Ogata's Japanese caustic in, ii. 545
penetrating cauterization, ii. 533
Piazza's fluid in, ii. 534
potassium hydroxide in, ii. 529

The injection of **quinine and urea hydrochloride** has been resorted to with success by W. Wayne Babcock (N. Y. Med. Jour., Mar. 3, 1917) for the destruction of angiomas and other new growths. He found it to offer the advantage, as a necrotizing substance, of being more readily handled than boiling water, and of not coagulating blood nor producing serious toxic symptoms should it enter into the blood-stream. While the injection causes intense though transient pain, marked secondary edema, a sluggish ulcer, a transient induration of the scar, and the possibility of serious symptoms from a quinine idiosyncrasy, the advantages of the method are: the intensity of the necrosis produced even in very vascular tissue; a secondary persistent anesthesia; the low toxicity of the substance employed; the convenience of the application especially upon mucous surfaces or other inaccessible regions of the body.

In angioma of the inside of the cheek injection was followed by the escape of a few drops of blood from the needle puncture, after which there was rapid necrosis, the slough separating without any evidence of hemorrhage and with complete removal of the tumor. A painless edema involving the entire half of the face largely subsided at the end of a week.

The author has tried the method also in internal hemorrhoids (using a 12 to 60 per cent. solution), urethral caruncles, warts, moles, keratoses and superficial and deep epitheliomas. He suggests that the injection of quinine and urea hydrochloride about a malignant growth may, by the production of edema, lymph blockage, and fibrosis with intense necrosis in the area of the injection, constitute a valuable agent in the removal of the tumor and in the prevention of metastasis, though he observed recurrence in 1 epithelioma of the face after 2 injections. In carcinoma of the pharynx and tonsil the method should be tried, also for post-pharyngeal fibromas. Introduced into the enlarged faucial and lingual tonsils, the injection is practically painless, much of the solution escapes, and the secondary necrosis is insufficient.

The technique followed by the author is as follows: An ordinary hypodermic syringe is employed, and for convenience, a 33 per cent. and a 50 per cent. solution of quinine and urea hydrochloride is prepared in ampoules containing 2 c.c. (32 minims) each. With a fine needle the affected area is infiltrated, taking care not to infiltrate too widely. The chief action of the injection is to block the circulation and cause ischemia; therefore the entire area is infiltrated, or a proximal infiltration is so given as to cut off the blood-supply. In treating sensitive areas the preliminary injection of a ½ to 1 per cent. **novocaine solution** may be desirable to prevent the initial pain.

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Skinner (Jour. Mo. State Med. Assoc., xii, 411, 1915) states that the **X-ray** treatment of angiomata is based upon biologic effects which have been proved by experimentation and practice. The tunica intima of blood-vessels is especially radiosensitive, and the application of the ray in measured filtered doses eventually leads to the obliteration of the vessel channel. The ray also promotes the obliteration and contraction of tissue elements. He advises administration of massive doses at increasingly longer intervals, and in general recommends the substitution of a painless non-deforming Roentgen treatment for mutilating surgical procedures.

  zinc chloride in, ii. 529, 534
  zinc chloride emulsion in, ii. 545
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Angioneurotic edema, see Edema, Angioneurotic, ii. 205; also this Index.
Angiosarcoma, ii. 759
Angiosclerosis, blood-pressure in, ii. 492
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Angiotelectasis or telangiectasis, ii. 502

Symptoms.—Fearnsides (Brit. Jour. of Dermat., Feb., 1912) observed a series of 6 cases in children, in which telangiectases, erythema, and purpura occurred in connection with wasting and protracted diarrhea. The erythema was present in all the cases, and in 5 was associated with telangiectases. The writer concludes that these various rashes were the expression of vascular dilatation, and were the direct result of the wasting brought about by the prolonged diarrhea.

Etiology.—Schridde (Deut. med. Woch., Feb. 1, 1912) examined microscopically the amputated finger in a case of telangiectatic granuloma. The findings sustained the view that the lesion is the work of protozoa, and that it is analogous to Oriental sore and Peruvian verruga.

W. Steiner (Amer. Climat. and Clin. Soc.; Med. Rec., Oct. 7, 1916) observed hereditary hemorrhagic telangiectasia in 2 families, a condition made a clinical entity by Rendu. It attacks both sexes equally, and is transmitted alike by both. Twenty families have been recorded. In one of the author's cases the syndrome was traced through 5 generations. The **cautery** is the best method of treatment for the troublesome, bleeding telangiectasis.

Anguillula intestinalis et stercoralis, vii. 319
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Anhalonine, i. 698
Anhalonium Lewinii, i. 698
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  pilocarpine in, viii. 445
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Anidrosis, see Anhidrosis, viii. 444
Aniline poisoning.

This form of industrial poisoning was very rare in this country until war caused the aniline industry rapidly to develop to considerable proportions, with the result that this occupational disease has become an important factor. Workers engaged in the manufacture of aniline, in rubber work, and in the use of certain washes for printing press rollers are those mainly subject to the intoxication. Poisoning is due to aniline itself and to its associated impurities, which are closely allied to it both chemically and toxicologically. Luce and Hamilton (Jour. Amer. Med. Assoc., May 6, 1916) published a valuable summary of the European observations on the industrial diseases thus produced, and also a statement of the industries in which the aniline products have recently come to be used in this country. Pure aniline is not poisonous, but it is not used in industry. What is used is a mixture of aniline and metatoluidin, paratoluidin, orthotoluidin and xylidin in varying proportions. Unlike most volatile poisons it gives no warning, but is toxic in even smaller doses than are benzene, chloroform or carbon disulphid. The *symptoms* are common to the whole group including nitrobenzene and its derivatives. The first is weariness or sleepiness, flushing of the face, sense of fullness in the head and even slight mental confusion, dryness of the throat and difficulty in swallowing. As the intoxication increases, the color of the face changes from red to livid blue or even to deep purple. The pulse is rapid and weak, the temperature subnormal, headache comes on early and is often violent with dizziness and nausea, and in more serious cases decided dyspnea, increasing mental confusion and sometimes loss of consciousness, which may occur suddenly sometimes after one has left the poisoned atmosphere. Usually industrial cases do not become severe, but they may confuse the physician. In milder cases the patients usually recover promptly, but severe cases may incapacitate a man for several weeks. Some seem to establish a tolerance preventing a second attack. The poison may enter by the skin or lungs or both. The principal *pathologic action* as a blood-poison is the formation of methemoglobin, and later symptoms are caused by elimination of the poison. The danger is aggravated by hot damp weather, heated rooms and poor ventilation. Young men seem more susceptible than elder ones, blondes than brunettes, and drinkers rather than the temperate. Its early recognition is important, and the treatment consists in fresh air, **oxygen** and **heart stimulants.** Prevention from subsequent exposure is imperative.

Sachs (Wiener klin. Woch., Nov. 9, 1911) noticed a remarkable production of warts or warty eczema on the hands of four persons working in aniline dyes. Tests of the various dyes rubbed into the inner surface of the rabbit ear confirmed the property of these dyes to induce granulation and epithelioma-like excrescences.

In a case of poisoning from hair dye, Damianos (Therap. Monats., Oct., 1911) traced the symptoms to chronic aniline poisoning, the dye containing paraphenylendiamin, the use of which is prohibited in Germany, Austria and France. The author had the patient's head washed repeatedly to get rid of the dye and gave her **hexamethylenamine** for 3 weeks and large doses of **bromides** for 3 months, by which time the patient who had suffered from photophobia, spasm of the lids and epileptiform seizures resembling Jacksonian epilepsy, was able to sit up and bear the light. Improvement continued, with no further attacks, but there is still a marked tendency to depression.

Hartogh (Nederlandsch Tijd. v. Geneesk., July 10, 1915) reports the case of a young man who, just before taking part in an athletic contest, became extremely cyanotic. He had headache and vomited, the pulse was 90, the respiration was accelerated, and there was some delirium. The writer suspecting aniline poisoning, examined the young man's gymnasium slippers which the day before had been dyed black. They had been worn but an hour and a half when the symptoms developed. Under **stimulants, fresh air** and **cold water to the head,** recovery gradually ensued.

Creyx (Jour. de Med. de Bordeaux, Aug. 3, 1913) reports a case of aniline poisoning in a healthy young man who wore a pair of russet shoes which had been dyed black and were still not quite dry. In 2 hours he became livid, with extreme cyanosis, the lips bluish, the ears purple, the nostrils retracted; the respiration was 29, the pulse, small but regular, was 120, and the skin was chilly, but there was no nausea, dizziness, syncope or tendency to collapse. In a second case the young man had put on the newly dyed shoes without socks and started out on his bicycle. In 15 minutes he was seized with nausea, and fell in a syncope from his wheel. After 5 hours the typical symptoms began to abate but the weakness persisted for 3 days, during which period he was incapable of the least physical or mental effort. In a third patient, a woman who grew pale and dizzy during the afternoon on several occasions, the attacks coincided with the wearing of green stockings, and they never recurred after she had discarded these stockings. In 1910 Landouzy reported 10 cases of similar poisoning from russet shoes dyed black, all in children.

R. J. McCurdy (Arch. of Ophthal., May, 1916) observed a case in a lady who, while sharpening an aniline pencil, got a considerable quantity of the aniline dust in her right eye. Four hours later a few fine particles were washed out, but most of it was dissolved and had stained the conjunctiva most deeply in the nasal half of that of the lower lid, but to some extent throughout the lower lid and the lower half of the globe. After 5 days the color had disappeared, the conjunctiva of the globe was congested and swollen, that of the lid red and raw as after a burn. Two weeks later the conjunctiva of the lower lid was covered by a sloughing false membrane, and 2 days after this signs of necrosis appeared in the nasal part of the lid, which continued for 3 weeks without apparent infection, and then the inflammation began to subside. During all the period of the inflammation, covering 2 months, there was much pain sufficient to prevent sleep at times. The final result was a cicatricial adhesion of the lid to the eyeball, and a cicatricial eversion of the nasal half of the lid, conditions that had to be corrected by operation. Quite a number of similar cases have been reported, in many of which the injuries were trivial.

All **aniline matter** should be **washed out** as quickly as possible. A 10 per cent. **solution of tannic acid** makes the undissolved aniline insoluble and may be instilled if the case is seen very soon after the accident, but usually it is of little benefit because the aniline dissolves rapidly and is apt to have penetrated beyond reach before the treatment can be applied. Aniline acts as a caustic, and the treatment, in addition to **cleansing** and the use of **tannic acid** as an antidote, is that of ordinary burns of the eye.

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Animal extracts, or organotherapy, i. 700.
    See also various.
Aniridia, vi. 62
Ankle, dislocation of, iv. 331
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  tabetic arthropathy, vi. 122
    Pirogoff amputation in, vi. 122
Ankyloblepharon, iv. 726
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Ankylosis, vi. 144

Pathology, vi. 145.—In experiments in dogs, in which the cartilage was removed by operation or the joint partially excised, bony ankylosis was found by Allison and Brooks (Jour. Amer. Med. Assoc., Jan. 30, 1915) to be a slowly developing process. Union occurred by granulation tissue and also by dense fibrous tissue. There was metaplasia of fibrous tissue into cartilage and a direct transformation into bone. The shortest time for complete ankylosis in the experiments was 180 days. The long duration of the fibrous stage indicates that any method of arthroplasty should seek to prevent fibrous ankylosis rather than bony ankylosis, and that introduction of irritating substances into the joint should be avoided. Experiments in which the joint cavity was infected or in which slight injury was done the cartilage, showed that any inflammatory process in the joint, severe enough to cause granulation tissue, will destroy the joint cartilages.

Treatment, vi. 145.—In gunshot injuries of the joints in which ankylosis is expected, R. Jones (Brit. Med. Jour., Apr. 29, 1916) finds that certain selected **definite positions** are of greatest use to the patient. The arm should be abducted to about 50 degrees, with the elbow slightly in front of the coronal plane of the body. For the elbow joint, fixation at just below a right angle—about 100 degrees—is usually preferred. In the forearm, if pronation and supination are to be lost, the radius should be fixed midway between pronation and supination. Wrist joint injuries should be treated with the wrist dorsiflexed. Ankylosis of the hip joint should be encouraged in a position of very slight abduction and outward rotation with thigh extended. The knee should be extended, and, in ankylosis of the ankle, the foot kept at a right angle with the leg. In injuries of the tarsus and metatarsus care should be taken during the later stage of healing to adjust a splint having an inside arch padded to conform to the natural shape of the foot. Eversion should be guarded against, and the hollow of the arch emphasized. Later, the heel should be raised on the inner side, and, if the metatarsals are involved, to permit early walking, a bar placed across the sole of the boot behind the tread.

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Ankylosis (*continued*).
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Unilateral, painless, bony ankylosis of the knee, hip, shoulder, and possibly elbow, should at present be submitted to **arthroplasty** only after realization by the patient of the prolonged and often painful after-treatment and the somewhat uncertain results. In only 1 of Osgood's (Surg., Gynec. and Obstet., Dec., 1913) cases did considerable inflammatory reaction follow the use of Baer's chromicized pig bladder membrane, but in every case there was a slight discharging sinus, sometimes coming on as late as 3 weeks after the operation, and often persisting for months. In 3 cases the membrane was wholly or partly extruded several weeks after the operation; but this did not seem to interfere with persisting mobility. In cases in which free fascial flaps were used, healing was by first intention, and no sinuses occurred except in 1 case of tuberculosis developing in the elbow 6 months after operation.

J. B. Murphy (Jour. Amer. Med. Assoc., June 6, 1914) reported 9 cases of *ankylosis of the jaw* treated by **arthroplasty**, which he advocated in such cases. A pedicled flap was used as interposing material, consisting of fat, the aponeurosis of the temporal muscle, and sometimes a few muscle fibers. The steps of the operation were: (1) An L-shaped incision; (2) division of ankylosis and removal of a segment of the mandibular neck; (3) raising flap of temporal fascia and fat; (4) interposing flap and fixing it in place; (5) closure of wound.

The predisposing age for ankylosis of the jaw, according to C. J. Lyons (Jour. Amer. Med. Assoc,, Jan. 20, 1917), is from 1 to 10 years. Trauma is the primary cause in the greatest number of cases, while scarlet fever, otitis media, dento-alveolar abscesses and *gonorrhea also* play a part in its production. The cartilage is gradually transformed into a vascular or fibrous or fibro-osseous tissue; the joint cavity is traversed by dense fibrous bands; and in the more severe cases this is converted into a mass of spongy bone. The best treatment consists in removing a section from the condyle, interposing fascia between the ends thus formed.

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injections in, vi. 147
insertion of dead matter in, vi. 149
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W. R. MacAusland's experience (Jour. Amer. Med. Assoc., Jan. 23, 1915) having revealed objections to the use of fatty tissue, such as embolus, fatty necrosis from poor circulation and skin necrosis, he resorted to another procedure in 2 recent cases. After trimming the joint and breaking up the ankylosis to as near approach to the normal joint as possible, removing only such bone as would prevent free motion, he interposed fascia transplanted from the thigh. This afforded a satisfactory result.

Okinczyc (Jour. de Chirurgie, July, 1914) found only 18 cases on record of operative treatment of ankylosis of the knee of gonococcal origin. Results were generally poor, and there is little to encourage operation unless the joint is severely crippled, both knees affected, or, with incomplete ankylosis, pain occurs on use. The gonococcal process is prone to recur, usually extending around the joint. Payr, waiting a year before operating, removed capsule, ligaments, and fibrous tissue, leaving only the musculature, and interposed pedunculated flaps of aponeurosis lined with cellular-fat tissue from the vicinity, with resulting perfect function 2 years later.

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joint broken up in, vi. 147, 149, 150
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osteotomy in, vi. 147
passive motion in, vi. 146, 147, 149
periosteal flaps in, vi. 148, 149
pig-bladder membrane flaps in, vi. 149, 150
plaster bandages in, vi. 149
pseudoarthrosis in, vi. 149

Sheet silk and bayberry wax has been successfully used by R. O. Meisenbach (Amer. Jour. of Orthop. Surg., Apr., 1914) in 4 cases of bony ankylosis, to produce a pseudoarthrosis. These materials produce but little post-operative reaction.

reduction, careful, in, vi. 147
resection in, vi. 147-149

In war injuries, Mouchet and Gouverneur (Jour. de chir., xiii, 329, 1915) consider resection indicated in many cases of ankylosis of the elbow-joint. If the wound is not completely healed, and ankylosis is at an obtuse angle, operation is clearly indicated. If the ankylosis is at a right angle, and the hand is in extreme pronation, operation is also indicated. If the injury is recent, any injured nerves may be freed at the same time. If 6 months or more has elapsed and trophic disturbances have already begun it is too late to restore mobility.

The authors have never interposed any muscle, fat, or fascia between the bones, believing free resection will prevent reankylosis, and introduction of tissue increases the danger of infection. In 8 of 18 cases the results were excellent, the movements being practically normal. There was only slight lateral movement at rest, which disappeared during motion. In 7 other cases results were good, extension not being, however, complete, with slight lateral movement.

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rubber bandage in, vi. 146, 147
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splints in, vi. 146, 149
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tallow (mutton) in, vi. 147
tendon-sheath flaps in, vi. 149
thiosinamine in, viii. 527
transplantation of joint in, vi. 147-149

Deutschländer (Verhandl. d. deut. orthop. Gesellsch., xxxv, 34, 1915) tried in 2 cases transplantation of the entire knee-joint in cases of ankylosis. In 1 the whole joint, with capsule, ligament, and patella, was transplanted in a 13-year-old boy. Though the wound healed by first intention, 3 weeks after the operation the soft parts were discharged spontaneously, and at the end of a year there was complete reankylosis. In the second case, a 14-year-old boy, only bone and cartilage were transplanted, without soft parts. The wound healed by first intention, but the transplant atrophied rapidly. Three months later strips of fascia were interposed between the joint surfaces, and the results were better.

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Anomalies of eyelids, iv. 726
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Anopheles, varieties of, vi. 488
Anophthalmos, vii. 209
Anorchism, vii. 346
testicular extracts in, vii. 347
Anorectal operations, quinine and urea hydrochloride anesthesia in, iii. 395
Anorexia.

Etiology.—Neisser and Brauning have often observed patients who grew thin because their appetite was appeased with a few mouthfuls of food and they did not care to eat more and consequently were starving although their appetites were good. A research showed that it depended on the pressure within the stomach from the food itself or from the peristaltic contraction of the stomach or from pressure from without as from a tight corset. Besides laying aside the corset, suggestion served to train the young girls to eat normally and enjoy the entire meal with appetite instead of being satisfied with a few mouthfuls, but this once accomplished they rapidly took on weight. In another group of patients early satiation was traced to excessive tonicity of the stomach walls and hasty eating.

Treatment.—Sternberg (Therap der Gegenwart, Mar., 1913) holds that the cachexia of cancer is due in large part to the loss of appetite, and that in this as in other conditions with loss of appetite much can be done by fostering the appetite. The main point in treatment of anorexia, second only to removal of the cause, is to prepare the food in such a way that its taste will be attractive to the patient.

alcohol in, i. 530
cannabis indica in, iii. 8
creosote in, iii. 687

S. Floersheim (Dietetic and Hyg. Gaz., Feb., 1912) administered fresh pineapple juice to 150 cases in which anorexia was a symptom, including patients with simple anemia, convalescents from malaria, nephritis, pneumonia, typhoid fever, acute and chronic gastritis, and pulmonary tuberculosis. In chronic diseases of the stomach in general, especially in alcoholic cases, the juice was productive of considerable benefit. In gastric and duodenal ulcer, however, it was not well borne. In nephritis the juice proved useful after the acute attack had passed off, and in tuberculous cases with anorexia it was also of assistance. In anorexia, following attacks of acute hepatitis, hepatic colic, and acute cholecystitis, as well as in chronic liver and gall-bladder cases, the juice materially improved the appetite.

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ammonia (aromatic spirit) in, ii. 8
ammonium bromide in, ii. 8
autosuggestion in, ii. 11
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bromides in, ii. 8
cocaine in, ii. 9
carbonated water in, ii. 9
champagne in, ii. 9
compulsory feeding in, ii. 10
diet in, ii. 8
feeding with nasal or stomach tube in, ii. 9
forced feeding in, ii. 11

N. G. Orchard (N. Y. State Jour. of Med., Jan., 1914) reported a case of anorexia nervosa in a child about 1 year old, apparently in normal health. When given a new nipple it refused to take food afterward. Every possible method and kind of food was employed to persuade the child to eat, but without success. At length gavage was instituted and carried out for several days; after this the child again began to take food in the usual way. De Witt H. Sherman (Med. Rec., May 24, 1913) observed an instance in which a child refused food and finally died.

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Antepartum hemorrhages as indication for induction of abortion, i. 181
Anterior chamber, blood in, pilocarpine in, vii. 472
gastroenterostomy, i. 66
Anteversion of the uterus, viii. 748
Anthracosis, see Pneumonokoniosis, vi. 461; also this Index.
Anthrax, ii. 11

Diagnosis, ii. 12.—The resistance to heat of certain precipitins, especially those of anthrax in cattle and swine plague, is considered important by A. Ascoli (Policlinico, Feb. 4, 1912). The reaction is obtained in a few minutes by simply boiling a little of the material in 3 or 5 times the amount of physiologic salt solution and pouring the cooled filtrate on the precipitating serum. The ring and zone at the point of junction are characteristic for these two diseases in domestic animals, while with extracts from pellagra, septicemia and lymphadenitis the reaction is invariably negative. The *Ascoli reaction* was found to be specific by Izabolinsky and Patzevitch (Roussky Vratch, May 5, 1912). The reaction occurs with fluids and tissues which have undergone putrefaction (for forty days, in the author's experiments), and is most marked when a solution from the spleen is employed.

A unique case of anthrax septicemia, the result of a bullet wound, was reported by Couteaud (Bull. de l'Acad. de Méd., Dec. 8, 1914). Marked contrast was soon noted between the apparently insignificant wounds of entrance and exit and the coexisting intense general prostration, the wounds even on the fifth day showing but little tendency to suppuration. The diagnosis was made by blood-culture, injection into a guinea-pig, and subsequent rapidly fatal course of the disorder.

Etiology, ii. 13.—To test insect transmission of anthrax, M. B. Maitmain (Public Health Reports, Jan. 9, 1914) transferred *stable flies* to healthy guinea-pigs with only a few seconds' interval after biting the infected host, and in the other instance an interval of 10 minutes elapsed between the feedings. A total of 20 flies were used in the first experiment, and 30 flies in the second trial. The exposed animals died in both cases during the evening of the third day. Typical pictures of anthrax infection were present at the necropsy. In addition a substantial gelatinous and hemorrhagic edema was observed in the subcutaneous region of the area upon which the flies were applied in biting. The spleens of both animals yielded characteristic square-ended rods, which showed typical picture when tested with McFadyean's differential stain. Pure cultures were obtained from the spleens of the dead animals. The growth on agar resembled that of the initial pure culture, and spores produced on a potato medium stained quite typically. The agar cultures when injected reproduced the disease with fatal results in guinea-pigs used in later experiments. Similar results were obtained in all essentials when *horse flies* were employed to transfer the disease from the sick to a healthy guinea-pig.

Elworthy (Lancet, Jan. 1, 1916) reports 3 cases of anthrax in which the infection was conveyed by means of *shaving brushes.* Two of the cases survived, whereas in the third the disease proved fatal. Both used and unused shaving brushes from the same source were found to be infected with anthrax bacilli. In a fatal case reported by E. H. Snell (Lancet, Jan. 29, 1916) smears of the blood from around the pustule showed many anthrax bacilli, some of which were abnormally swollen. The shaving brush of the deceased was found to contain anthrax spores.

W. H. Park (Med. Rec., Dec. 4, 1915) observed the case of a young woman who had edema of the face, following a tiny pustule like a mosquito bite. The edema spread to the chest. The fluid gave a pure culture of anthrax. There was no history of anthrax and no other traceable source of infection. The patient died in a few days.

W. v. Gozenback (Zeitsch. f. Hyg. u. Infektionskrankh., lxxix, 336, 1915) reports the finding of anthrax spores in the earth of a place which had been used 6 years before for burying diseased animals. The *burying ground* was wanted as a playground, and the investigation was undertaken to determine whether it was safe for such use. The author recovered anthrax bacilli 6 times by animal injections and twice by direct plating.

W. H. Brown and E. Simpson (Jour. Amer. Med. Assoc., Feb. 24, 1917) studied an outbreak of 25 cases observed within 4 months. Of these, 23 occurred in persons handling hides. It was confined to workers in tanneries where dried "China" hides were used. All of the hides had reached America in the same cargo and had come from a district of China in which anthrax was known to be endemic.

Prognosis, ii. 15.—The prognosis is grave when the bacilli are found in the blood, and absolutely unfavorable if they are present in large numbers.

Becker (Münch. med. Woch., Jan. 23, 1912) knows of only 3 cases in the literature and 2 in his own experience in which the patients survived after the bacilli had been cultivated from the blood; 1 of these 2 had been treated with specific serum, 1 with salvarsan. Once the bacilli are in the blood it is useless to excise the lesion.

Prophylaxis, ii. 16.—Glynn and Lewis (Jour. of Hygiene, June, 1912) found spores in more than 20 per cent. of samples of hides, wool, hair, and bones, and importations from the Malay States, and also in samples disinfected by the methods now in vogue. This obviously indicates that these methods are as yet imperfect.

A successful **anthrax serum** was obtained by Detre (Virchow's Archiv, ccxiii, Nos. 2-3, 1913) by immunizing a horse with cultures of the bacilli. It seems to be strongly bactericidal and contains agglutinins which agglutinate anthrax bacilli in very minute dilutions. This specific agglutinating power can be utilized in identifying the bacilli.

Izabolinsky (Jour. Amer. Med. Assoc., from Roussky Vratch, Dec. 26, 1915) immunized rabbits by injecting intravenously, subcutaneously, or into the peritoneum extracts of anthrax bacilli prepared according to the method of Markoff. The best results, however, were obtained from a serum prepared according to the formaldehyde technique: A 24 hour culture of anthrax bacilli is rinsed with 50 c.c. of distilled water. To this amount 5 c.c. of formaldehyde are added. When the mixture becomes clear, it is rendered neutral by adding sulphuric acid, and then it is placed on a water bath at 56° C. for 2 hours or longer, up to 4 hours, if the starch-iodin paper shows no reaction. The formaldehyde extract was injected into rabbits subcutaneously. The initial doses were 1 or 2 c.c. After 5 weeks of immunization, a **serum** was obtained that gave a precipitation ring as soon as it was brought in contact with the anthrax antigen. (See also Serum below.)

actual cautery in, ii. 17
alsol in, i. 588
aluminum acetate in, ii. 17, 18
bacterial vaccines in, ii. 19
boric acid in, ii. 18
carbolic acid in, ii. 18
cauterization in, ii. 17

Rapid method of treating anthrax by means of **live steam** described by S. Gucciardello (Med. Rec., Jan. 31, 1914). It is bloodless and can be carried out with an improvised apparatus. Any kettle or vaporizer can be used, provided that it be fitted with a spout 2 cm. in diameter, bent in such a manner that the outer end points in a horizontal direction. Generally a temperature of 50° to 55° C. (122° to 132° F.) can be easily borne. The steam is directed upon the lesion and the normal parts that immediately surround it, the whole being enclosed within a cardboard cylinder, which serves to confine the action of the steam. The cardboard cylinder should be 30 to 40 cm. long, and may be held at a slight distance from the skin so that the steam may have ready egress. If the anthrax is on the **neck or head**, the latter should be **wrapped in cold cloths**, frequently renewed, in order to prevent cerebral congestion. From 5 to 7 applications of the steam, of 1 hour each and at intervals of 1½ hours, may be given in the course of 1 day. During the intervals the sore part may be covered with gauze dipped in hot water.

From the very beginning of the treatment the patient is said to experience its soothing effects. The pain diminishes, sleep becomes possible, and the temperature tends to subside. The extension of the disease process is stopped from the outset. The writer's experience was based on 50 cases.

crucial incision in, ii. 17, 18
disinfection of dejecta in, viii. 503
incisions in, ii. 18
iodanisol in, ii. 18

Anthrax (*continued*).

iodine in, ii. 18

ipecacuanha in, ii. 19

In 18 consecutive cases of anthrax without a death W. Phillips's (China Med. Jour., May, 1915) treatment consisted of surrounding the pustule at a distance of about ½ inch, with a ring of hypodermic injections of 5 per cent. **phenol solution,** deep into the subcutaneous tissue; from 40 to 80 minims (2½ to 5 c.c.), in all, being employed. This is repeated each day for 3 or 4 days, when a **fomentation** of **powdered ipecac** (about 1 dram—4 Gm.—moistened with a little warm water) is applied and covered with oiled silk. The fomentation is repeated daily until the black slough begin to separate, after which **wet boric acid dressings** are used to expedite healing.

Owing to the value of powdered **ipecacuanha poultices,** H. W. White (Jour. Amer. Med. Assoc., Sept. 23, 1916) has made a practice of carrying the ipecac in his first aid package and has used it as a poultice in 2 cases. The pustule stopped growing and became soft, with recovery as result.

[This suggests that **emetine** given internally, as in amebic dysentery, *q. v.*, might check anthrax where poultices of ipecacuanha prove inadequate or inapplicable where the surfaces involved are too great. C. E. de M. S.]

mercury bichloride compresses in, vi. 681

mercury bichloride dressing in, ii. 17, 18

J. Palmar, Jr. (Jour. Amer. Med. Assoc., Nov. 6, 1915), in 42 cases of anthrax affecting the cutaneous and cellular tissues, thoroughly but gently washed the area with 1:2000 **mercuric chloride** solution, dried well, then swabbed it with 10 per cent. tincture of iodine and some **alkali** applied. This is repeated daily for several days until the slough has come away. It takes about 2 or 3 weeks for an ulcer to heal, which it does with very little scar as compared with the tissues involved. No systemic treatment was necessary other than purgation, though some require **strychnine** and **alcohol.** If the vesicles are kept unruptured it is better for the patient. The fatal cases seen were those in which the vesicles had been opened. J. P. Wales (Jour. Amer. Med. Assoc., Nov. 6, 1915) also holds that it is important to let the vesicle alone. When the blood-vessels and lymphatics are opened, a worse infection in the tissues around the vesicle will ensue.

G. T. Villa (Rep. de med. y cir., Bogota, vii. 304, 1916) having exhausted all local treatment, including cauterization, for malignant pustule, with considerable edema, the cervical ganglia being tumefied and painful, gave an intravenous injection of 2 c.c. (30 minims) of **bichloride of mercury** solution in **saline solution,** compresses to the face and **potassium chlorate gargles.** Within a few days all symptoms were subsiding and finally disappeared.

nitric acid in, ii. 17

oxygen in, vii. 275

Paquelin thermocautery in, ii. 17

phenol in, vii. 444

potassium aurocyanide in, vii. 584

potassium hydroxide, vii. 576

salvarsan in, iv. 228

The use of **salvarsan** is considered worthy of further study by Boidin (Presse méd., Aug. 14, 1912). Anthrax sometimes yields to such measures as cauterization, iodinated or phenolated injections, amputations, etc., but not if complicated with edema. If septicemia supervenes, death is certain, unless the antianthrax serum is used. Several cases mentioned in which this serum proved useful. A case of anthrax was treated by L. Buberl (Münch. med. Woch., June 16, 1914) with salvarsan intravenously, the dose employed being 0.6 Gm. (10 grains). The improvement was almost immediate. The temperature fell very rapidly to normal and the pulse become slower and fuller. The edema of the forehead and cheek, as well as the swelling of the neighboring glands, disappeared rather rapidly under treatment with warm applications of **Burow's solution.** Tincture of **iodine** was used on the pustule. The scab separated after about a month and left a deep scar.

Heim (Correspondenz-Blatt für schweizer Aerzte, Sept. 30, 1916) relates a case of malignant pustule which was not arrested by local treatment. The patient's temperature continuing to rise, and his general condition to grow worse, 0.45 Gm. (7 grains) of **neosalvarsan** was injected into his veins; improvement occurred, immediately followed by recovery.

Sclavo's serum in, ii. 19
serotherapy in, ii. 19

In a series of experiments on the production of anthrax serum Adolph Eichhorn (U. S. Dept. of Agric. Bull., No. 340, Dec. 27, 1915) concludes as follows: 1. Horses are suitable for the production of highly potent anthrax serum. Serum of such horses should protect large animals in 10 c.c. (2½ drams) doses. 2. The use of the serum-alone treatment is indicated in cases where the infection has already occurred in a herd. Since the serum confers only a passive immunity, it is advisable to revaccinate the herd in from 3 to 5 weeks by the simultaneous method. 3. The serum possesses great curative value. Depending on the severity of the infection, the curative dose is from 30 to 100 c.c. (1 to 3⅓ ounces) the injection to be repeated if necessary. 4. For the simultaneous treatment a spore vaccine, carefully standardized, is preferable to the ordinary Pasteur vaccine. 5. Spore vaccine should be employed also in preference to the Pasteur vaccines for immunization with vaccine alone. This vaccine has a decided advantage over the Pasteur, because of the possibility of more accurate dosing and because of its better keeping qualities. 6. Experiments with concentrated serum and dry spore vaccine are very promising. This method would greatly simplify the vaccination process and also insure the product against subsequent contamination and deterioration.

Soberheim's method in, ii. 19
thermocautery in, ii. 18
vaccines in, ii. 9
bacilli, **hydrogen dioxide** against, v. 570
Antifat cures, dangers of, v. 303
Antifebrine, see Acetanilide, i. 213
Antigen, preparation of, v. 386, 387
Antimony, ii. 19

U. N. Brachmachari (Lancet, Oct. 21, 1916) states that a **stable colloidal antimony** may be prepared by the following method: A current is passed in sparks from an induction coil, and an eight volt accumulator between two aluminum foil electrodes immersed in chloroform containing coarse particles of metallic antimony. The antimony passes into a powdery state and some goes into solution. When the chloroform is distilled off a tardy residue of colloidal antimony is left. This can be dried in a desiccator, in air, or even over a Bunsen burner without materially affecting it. Colloidal antimony was found by the author to possess remarkable therapeutic power in protozoal diseases.

poisoning, acute, ii. 22
caffeine in, ii. 23
calcium salts in, ii. 23
camphor in, ii. 23
coffee infusion in, iii. 516
demulcent drinks in, ii. 23
digitalis in, ii. 23
external heat in, ii. 23
magnesium salts in, ii. 23
morphine in, ii. 23
opium in, ii. 23
stomach-tube in, ii. 23
strychnine in, ii. 23
tannic acid in, ii. 23
poisoning, chronic, ii. 24
Antiperistaltic unrest, viii. 358
Antipyrin, ii. 27

Physiological Action, ii. 29.—Rabbits normally respond to antipyrin, in doses of 0.1 to 1 Gm.—1½ to 15 grains—(sometimes as low as 0.06 Gm.—1 grain) per kilo animal, by a fall in body temperature with marked peripheral vasodilation, and, where the dose is above 0.3 Gm., with hyperpnea. Doses in the neighborhood of 1 Gm. per kilo may cause fatal convulsions. The cerebrum and corpus striatum were removed by Barbour and Deming (Jour. Amer. Med. Assoc.; Jour. of Pharmacol. and Exper. Therap., Nov., 1913) from 18 rabbits. In 9 of these cases, being those exhibiting as a rule the fewest anatomic complications, a subnormal body temperature (32.5° to 37.5° C., the morning after operation) resulted. The remaining 9 animals (besides 2 of the first mentioned 9, for the first 4 days after operation) behaved essentially like normal animals. The hypopyrexia animals showed signs of collapse, asymmetrical muscular disturbances, peripheral vasoconstriction and slow respiration. Their temperature condition was not due to cold, starvation or hemorrhage, but to a disturbance of central heat regulation, probably seated chiefly in the corpus striatum.

When given 0.1 to 0.4 Gm. (per kilo) antipyrin they showed a definite rise in temperature rather than a fall, and a conspicuous absence of the vasodilation usually seen after the drug, as well as of the hyperpnea which would be expected from the larger doses within this range. Muscle stiffness was in evidence, bordering, with the larger doses, on tonic and clonic convulsions. Animals completely decerebrated, including corpora striata and optic thalami, gave a temperature of 26.5° to 32.5° C. on the morning after operation. Antipyrin in doses below 0.33 Gm. per kilo had no effect on these animals. Four-tenths Gm. and above always gave a definite temperature rise. Neither vasodilation nor high respiratory rates were seen. Muscle stiffness or tetanic spasms were noted. The authors conclude that the reversed effect of antipyrin on body temperature in these cases is due to the normal heat-producing property of the drug. This property is brought into prominence by operative impairment of the heat-dissipating mechanism as well as of certain normal inhibitory influences which the higher centers exercise over the processes of heat production.

Untoward Effects, ii. 34.—Nicolas and Moutot (Ann. de Dermat. et de Syph., No. 11, 1911) observed a case of bullous eruption in the buccal cavity due to the ingestion of antipyrin. They call attention to the possibility of such eruptions being limited exclusively to this region.

poisoning, acute, ii. 34, 38
  ammonia (aromatic spirit) in, ii. 40
  ammonium carbonate in, ii. 40
  artificial respiration in, ii. 40
  atropine in, ii. 40
  caffeine in, ii. 40
  camphor in, ii. 40
  coffee (hot, strong) in, ii. 40
  digitalin in, ii. 40
  digitalis in, ii. 40
  external heat in, ii. 40
  oxygen inhalations in, ii. 40
  saline solution in, ii. 40
  strychnine in, ii. 40
poisoning, chronic, ii. 40

Therapeutics, ii. 41.—Antipyrin by rectal injection is recommended by A. Guérin (Jour. de Méd. de Bordeaux; Med. Rec., Jan. 25, 1913). Montenius has used it in the form of a small rectal injection in **infantile convulsions** and vomiting in doses of from 0.25 to 0.5 Gm. (4 to 8 grains) dissolved in 15 c.c. (½ ounce) of water. Guyon and Guiard found that given in this way with the addition of a small dose of opium, antipyrin acts as a marked sedative in disorders of the **bladder**, especially in **prostatic disorders**. Mastboom employs antipyrin in the treatment of pelvic **neuralgias, dysmenorrhea**, and coccygodynia, according to the following formula which he has employed in a large number of these commonplace disorders.

℞ *Cocaine hydrochloride* ..... 0.10 Gm. (1½ gr.).
Antipyrine ..... 10 Gm. (2½ dr.).
Distilled water.. 30 Gm. (1 oz.).

Of this solution 1 teaspoonful is to be administered in the form of an enema.

A. F. Plicque (L'Odontologie; Dental Cosmos, Jan., 1913) lays stress on the value of antipyrin as a local anesthetic now often employed as a styptic in hemorrhage. Its astringent action renders it suitable also in painful inflammations, such as stomatitis, gingivitis, etc. While its action is not as strong as that of cocaine, relief is more lasting and effective, because the process of inflammation is abated. Even in ulcerative carcinoma of the tongue, antipyrin is very effective in alleviating the glossitis complicating these ulcerations. For these local applications by painting, a simple aqueous solution of 1: 10 is employed. For mouthwashes or gargles a 1: 50 solution is used. The disagreeable taste of antipyrin can be considerably improved by the addition of glycerin.

Antiseptics, see various drugs of this class: Mercury, Iodine, Phenol, etc.; also Sterilization and Disinfection, viii. 318, also this Index.
Antithrombin, v. 424
Antitoxic serum, see various diseases in which Sera are used; also Hematology.
Antitoxin, see various diseases in which Sera are used; Diphtheria, Tetanus, etc.
Antitryptic index in cancer, ii. 774
Antivenin, see Venomous Wounds, this Index.
Antrum of Highmore, see Maxillary Sinus, viii. 141
Anuria, see Urine, Retention of, viii. 719; also this Index.
Anus, artificial, closure of, infiltration anesthesia in, iii. 497
  in hernia, v. 466
  thiosinamine in, viii. 530
 condylomata of, cocaine in, iii. 490
 congenital malformations of, vii. 771
 dermoids of, cocaine in, iii. 490
Anus (*continued*).
 diseases of, see Rectum and Anus, Diseases of, vii. 734
 fissure of, see Anal Fissure, vii. 734; also this Index.
 fistula, see Fistula in Ano, vii. 740; also this Index.
 sebaceous cysts of, cocaine in, iii. 490
Aortic insufficiency, apocynum in, ii. 61
  digitalis in, iv. 145, 147, 149
  iron in, vi. 87
  oxygen baths in, vii. 275
 insufficiency, with excessive hypertrophy, nitroglycerin in, vii. 54
  sodium nitrite in, vii. 54
 lesions, double, nitroglycerin in, vii. 55
 obstruction, elaterium in, iv. 415
 regurgitation, iv. 489
  adonis vernalis in, i. 433
  ammonia in, iv. 495, 504
  amyl nitrite in, iv. 503, 504
  arsenic in, iv. 495
  aspirin in, iv. 495
  belladonna in, iv. 495
  blisters in, iv. 495
  blood-pressure in, ii. 493
  caffeine in iv. 504
  digitalis in, iv. 148, 495, 503
  elaterium in, iv. 415
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  rest in, iv. 495, 503
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  salicin in, iv. 495
  strychnine in, iv. 495
  veratrum viride in, iv. 504
 stenosis, iv. 495
  digitalis in, iv. 148
  nitroglycerin in, vii. 55
  potassium iodide in, iv. 497
  thiosinamine in, vi. 504; viii. 530
Aortitis, chronic, thiosinamine in, viii. 530
Apathy of infectious diseases, caffeine in, iii. 525
Apepsia, infantile, pepsin in, vii. 362
Aperient waters, vi. 711
Aphakia, iii. 709
Aphasia, ii. 47

Diagnosis, ii. 50.—In a case described by H. A. Haubold (Surg., Gynec., and Obstet., xix, 669, 1914) in which there was no disturbance of consciousness and complete motor aphasia and ecchymosis in the region of the left eyeball the ophthalmoscope showing changes in both discs, slightly more marked on the left side, a radiogram showed a small linear fracture of the skull on the side opposite to the apparent brain injury (bursting fracture). At no time did the picture of general cerebral compression obtain.

The skull was opened over the motor area by fashioning an omega-shaped scalp flap. A Doyen drill and burr were employed for the primary exposure, and the opening was enlarged with a biting forceps. No lesion was apparent until the dura was opened when 2 ounces of thick semi-fluid blood escaped. A partially coagulated layer of blood was removed from the under surface of the dura corresponding to the speech center. Blood continued to ooze from the base of the skull. The area was lightly packed with gauze, which was removed at the end of 48 hours. Uninterrupted recovery followed. Speech gradually returned and reached its normal range in about 7 days.

C. W. Burr (N. Y. Med. Jour., May 9, 1914) contends that the dementia often associated with aphasia is not due to this disorder as such, but is to be attributed to coincident or independent conditions, such as arteriosclerosis, senile degeneration, and the like.

Etiology, ii. 51.—The most frequent cause of aphasia, according to Chapman, Morris and Simrell (N. Y. Med. Jour., Aug. 2, 1913) has been from the use of obstetric forceps during delivery. About 80 per cent. of all cases seen by the writers could be traced to this cause. This is not surprising when one considers the condition of the bony tablets at birth and the amount of pressure frequently exerted upon them. As a rule, the indentation made by the forceps blade soon disappears, owing to the elasticity of the thin cartilaginous bones, but in some cases the inner tablet is split, a callus is formed upon its inner surface through the escape of osteoblastic cells, and thus the dent remains.

Pathology, ii. 53.—Bernheim (Revue de Méd., Feb., 1912) has adduced evidence to the effect that aphasic and other similar disturbances did not correspond quantitatively with the degree of involvement of the cortical centers supposed to preside over the functions concerned, but that dynamic changes should also be taken into account. He now reports a case, with autopsy, which tends to support these assertions. Notwithstanding widespread destruction of Broca's area, the insula, and the corpus striatum, direct transmission between the frontal lobe and the bulb being apparently entirely cut off, motor aphasia was not complete, nor anarthria present, even at the outset. At first spontaneous speech was impossible, though the patient could sing familiar songs and recite prayers; later, spontaneous speech was recovered. The case shows that Broca's area is not a speech center; that the lenticular region is not a center for phonetic co-ordination; that the white capsules do not represent the sole path of communication between the frontal lobe and bulb; and that the loss in power of cerebral speech does not correspond with intellectual deficiency, the latter waning in this patient while the power of speech was improving. J. H. Lloyd (N. Y. Med. Jour., May 9, 1914) holds that while Broca's convolution is the motor center of speech, it represents only one part of the speech zone, and without a study of the great primary auditory or sensory zone, by means of which the mother tongue is learned, one is likely to make grave mistakes in studying this obscure subject. Language, in its very nature, has a sensory as well as a motor element, and to attempt to separate these two is something like an attempt to separate force from matter, or form from substance.

According to A. Gordon (N. Y. Med. Jour., Jan. 4, 1913), not one special area alone is involved in the faculty of speech and in the various manifestations of aphasia, but very probably several anatomical elements simultaneously. The multiplicity of lesions ordinarily encountered in cases of aphasia is striking. If Marie did not solve the question of localization of aphasia, he had the great merit of showing the necessity of looking for pathological data in other than Broca's and Wernicke's areas. The clinical histories and necropsy findings in 2 cases in which aphasia was present led Archambault (Jour. of Nerv. and Mental Dis., Oct., 1912) to conclude that they substantiated the contentions of Pierre Marie by revealing that a lesion of the left inferior frontal convolution in a right handed individual does not necessarily determine motor aphasia, and that a lesion of the left lenticular region in a right handed individual may in itself suffice to produce permanent motor aphasia.

W. G. Spiller (Med. Rec., Apr. 11, 1914), as shown by specimens illustrating lesions of the left third frontal convolution and of the temporosphenoidal lobe, from cases which had presented respectively motor and sensory aphasia, emphasized the fact that the lesion is seldom so circumscribed as to be confined exclusively to a single center or to a single localization area.

Verger and Desqueyroux (Jour. de Méd. de Bordeaux, Mar. 2, 1913) report the post-mortem findings of a case of right hemiplegia and aphasia in a woman of 36 years. The hemiplegia improved rapidly, leaving her with defective movements and astereognosis of the hand, diminished tactile sensation, and loss of sense of position of the fingers. The aphasia was at first complete; but eventually the patient became able to speak with some freedom, though she could not string her words together into connected sentences. There was a considerable degree of word blindness and some dysarthria: she could write easy sentences, but was unable to read what she had written, and repetition of words was impossible. After death, which occurred 13 years after the attack, there was complete cortical and subcortical destruction of the lower parts of the second and third left frontal convolutions and the lower third of the ascending frontal convolution. There were diffuse atrophic changes in the insula, the inferior parietal lobule, the angular gyrus and the posterior part of the lenticular nucleus. The writer considers that the case does not support the views put forward by Marie, inasmuch as Broca's convolution was destroyed, with motor aphasia lasting for several months; the association of sensory aphasia with dysarthria was very incomplete; and there was no appreciable defect of intelligence.

Treatment, ii. 57.—Froment and Monod (Lyon méd., Feb. 15, 1914) recommend the **psychophysiological** method of speech re-education as an alternative to that which attempts to reteach the motor acts of articulation. Their method aims to restore the memory of sounds and the association between visual and auditory (word) impressions, beginning with individual syllables—some of which the patient can still articulate—and later building up polysyllabic words. The method is useful also where the usual method is inapplicable because of weakened intellection and attention.

mercury in, ii. 57
potassium iodide in, ii. 57
saccharin in, viii. 45

F. X. Dercum (Med. Rec., Jan. 10, 1914) observed a case of Déjerine's aphasia, pure motor or Marie's anarthria. The patient was a machinist, 48 years old, who suddenly de-

veloped paralysis of the entire right side of the body, with loss of the power of speech. Ability to read and to write both from dictation and from copy, however, remained. A positive Wassermann reaction being obtained, **salvarsan** was introduced into a vein and active mercurial treatment was instituted. Improvement in the symptoms speedily took place and articulate and intelligent speech gradually returned.

  sodium sulphite in, viii. 188
  trephining in, ii. 57, 58
 auditory, ii. 48
 infracortical motor, ii. 51
 motor, ii. 47, 53
 sensory, ii. 48

According to Cope (Brit. Jour. of Surg., Apr., 1914) traumatic sensory aphasia is often due to subdural hemorrhage pressing on the cortical sensory speech centers. It affects the visual more than the auditory speech center. If treated expectantly, recovery is generally incomplete, and there is a risk of epileptiform convulsions developing later. Treatment by **trephining** and **removal of the clot** is the best course.

Aphemia, ii. 47, 50
Aphonia,
  atropine in, ii. 446
  salvarsan in, iv. 209
 hysterical, **zinc valerate** in, viii. 836

Treatment.—Citelli (Revue hebdom. de laryn., etc., Dec. 20, 1913) pushes the thyroid cartilage to one side with sufficient vigor to cause pain, taking the patient unaware. Almost invariably this **thyroid deflection** will lead to an immediate verbal protest on the part of the patient.

Two cases of functional aphonia following the bursting of a shell in close proximity to the patient were treated by Tilley (Proc. Roy. Soc. Med., viii, Laryn., Sect., 1915) by a moderate intralaryngeal **faradic** shock. J. F. O'Malley (Proceed. Royal Soc. of Med.; Med. Rec., Nov. 13, 1915) observed 6 cases of aphonia which began in the trenches. In 4 the voice returned on asking the patient to **phonate** with the laryngeal mirror *in situ* for the purpose of examination, and a mild application of the **faradic current** was effective in the other two cases.

[That autosuggestion has much to do with the recovery of the voice in hysterical aphonia was well shown by a personal case, treated many years ago, in which voice was restored at the first sitting by direct application of the current to the vocal cords, with the Mackenzie electrode, the patient being directed to phonate while the current was on. When the patient had gone, I found that one of the poles had all the while been disconnected from the battery, and that all the patient had obtained out of it was the noise of the vibrator. C. E. de M. S.]

Aphrasia, see Aphasia, ii. 47
Aphrodisiac, **cannabis indica** as an, iii. 9
Aphthæ, **alcohol** in, i. 534
  boric acid in, ii. 585
  resorcin in, vii. 809
 Bednar's, vi. 726; see also Bednar's Aphthæ, this Index.
 cachectica, vi. 726
Aphthous fever, vi. 725
Apiol, ii. 58
Apocodeine, vii. 172, 176, 183
Apocynum, ii. 59
 poisoning, ii. 60
  amyl nitrite in, ii. 61
  evacuation of stomach in, ii. 61
  nitroglycerin in, ii. 61
  saline solution in, ii. 61
  veratrum viride in, ii. 61
Apomorphine, ii. 62

Physiological Action, ii. 63.—Eggleston and Hatcher (Jour. of Pharmacol. and Exper. Therap., May, 1912) from a study of the literature and experimental work, conclude that the evidence in favor of the existence of a central controlling mechanism for the act of vomiting is conclusive, and that apomorphine acts solely bv direct stimulation of this mechanism in the dog and probably also in man. There is no valid evidence in favor of a local reflex action of this drug.

- Apomorphine (*continued*).
  - poisoning, ii. 64
    - ammonia in, ii. 64
    - coffee in, ii. 64
    - external heat in, ii. 64
    - strychnine in, ii. 64
    - whisky in, ii. 64
- Apoplexy, see Cerebral Hemorrhage, iii. 83
  - pancreatic, vii. 282
  - retinal, vii. 199
- Appendectomy, i. 59, 74, 82, 83; ii. 105, 107, 108, 110; see also below under Appendicitis.
- Appendicitis, acute, ii. 68

Symptoms, ii. 68.—Deaver (N. Y. Med. Jour., Feb. 5, 1916) points out that in appendicitis *fever is always present.* If the appendix is in the pelvis the pain is likely to be left-sided. *Suddenly subsiding pain followed by a chill points to gangrene,* while *exquisite tenderness* denotes the presence of *pus.*

Proust and Paris (Rev. de gynéc. et de chir. abd., xxiii, 187, 1914) report a case of appendicitis in a girl of 8, with *pain at a point on the left side* symmetrical with McBurney's point appearing on the second day. There was no pain on the right side. Laparotomy revealed a ruptured abscess on the left side. Pain in this location is symptomatic of rupture of a pelvic abscess, the pus rising along the left border of the pelvic colon and breaking into the peritoneal cavity of that side. Left-sided pain in appendicitis may be due either to an appendix on the left side or to rupture of an abscess as in this case. In chronic appendicitis, Ruthkevitch (Roussky Vratch, Mar. 21, 1915) finds palpation the best diagnostic guide. He could feel the appendix in 60 per cent. of cases and *pain* was produced in 88 per cent. The palpation often caused pain *also in the upper abdomen.* If the flexed fingers of the right hand are pressed down between the external wall of the cecum and the abdominal wall, and then extended to deflect the cecum toward the midline, pain is invariably produced in chronic appendicitis. Ten Horn (Zentralbl. f. Chir., Oct. 3, 1914) found that *traction on the right spermatic cord produced pain* in 12 out of 15 cases of appendicitis. The pain is probably due to irritation of the peritoneum about the internal ring. Randolph Winslow (Jour. Amer. Med. Assoc., Feb. 7, 1914) states that in young women pain and tenderness in the right side, without rigidity, fever or leucocytosis is usually not appendicitis. Apparently severe and long-continued pain in the right side in girls is more likely to be neurotic than appendiceal. *Pain* may also be *reflected from the pelvic organs* or other viscera, and the primary seat of trouble may be determined by more careful examination.

Solieri (Revue de Chir., Apr. 10, 1913) discussing *epigastric pain* in appendicitis, noted that it may occur in 3 forms: 1. Sudden onset of violent epigastric pain, subsequently spreading. 2. Epigastric pain, constant or intermittent, between appendicular seizures. The epigastric pains may be more pronounced during the latter, or may be accentuated by dietary indiscretions. 3. Even without any previous acute manifestations, more or less persistent epigastric distress, accompanied by constipation and general depression. In the second form occur partial obliterative appendicitis, chronic empyema, chronic ulcerative appendicitis, etc.; in the third, congenital anomalies, with resulting chronic hyperplastic folliculitis. Operating under spinal anesthesia the writer found that epigastric pain can be induced when the appendix is pulled upon or compressed between the fingers. Evidently the *pain is a reflex phenomenon* provoked in the vagus domain by inflammatory or mechanical irritation of the appendix. The gastric dyspepsia of chronic or recurring appendicitis is similarly explained by reflex disturbance of secretory, motor and vasomotor conditions in the stomach through the vagus. T. Linn (Med. Council, May, 1912) points out that in diagnosticating appendicitis one should be first quite sure that the cause of the pain is not *superficial cutaneous hyperesthesia.* This can be done by simply pinching up the skin, drawing it away from McBurney's point and noting that upon deep pressure there is no true tenderness in the underlying structures. Such cutaneous hyperesthesia may be found in ordinary cases of indigestion. Likewise are confusing painful menstrual attacks accompanied by fever and all the symptoms of appendicitis.

McW. B. E. Sutton (N. Y. Med. Jour., Oct. 30, 1915) reports a case of acute appendicitis in which at operation there was found at the distal end of the appendix a ruptured abscess, firmly adherent to the posterior bladder wall, with beginning peritonitis. The symptom complained of, a sharp, *shooting pain in the vulva,* is probably diagnostic of adhesion to the bladder.

P. F. Bjalkus (Roussky Vratch, Sept. 29, 1912) asserts that *the appendix, if palpable, is diseased.* Generally, palpation of a diseased appendix is possible.

According to Randall (Jour. Amer. Med. Assoc., June 5, 1915), while ordinarily rigidity of the right rectus is a reliable guide to appendicitis in some cases *rigidity of the right external oblique* is present instead. These cases are mild, many patients being up and about at the time, but a high polynuclear count exists. In over 20 cases with rigidity only of the right external oblique, the appendix was retrocecal or retrocolic.

Outland and Clendening (Amer. Jour. Med. Sci., Feb., 1917) observed *hematemesis* in a case of true appendicitis. Chains of small glands in the omentum and mesentery pointed to a stream of infection carried up the omentum and deposited at the pylorus. The hemorrhage of the stomach is attributed to the seepage from an inflamed gastric mucosa and serosa. There had been dyspepsia, hyperacidity, and epigastric pain.

Bischoff (Monats. f. Geburtsh. u. Gynak., Sept., 1914) reports favorable experiences with *Bastedo's sign:* If one distends the previously emptied bowel with air through a rectal tube, pain over McBurney's point is elicited if the appendix is diseased. [See detailed technique under Appendicitis, Chronic, below.] According to Goodman and Lüders (Amer. Jour. Med. Sci., Sept., 1914) *inflation of the colon* should be regarded merely as an aid in the diagnosis of appendicitis, history and physical examination being far more valuable. The writers have seen no positive reactions in normal individuals. The method is unsafe and rarely useful in acute appendicitis, and it is in no sense pathognomonic of chronic appendicitis.

In appendicitis, according to J. Duvergey (Paris méd., May 10, 1913), the liver directly suffers from the toxines elaborated, venous blood from the appendix passing at once to it. There result variations in urea excretion. Severe appendicitis cases show a *marked decrease in urea excretion,* replaced in convalescence or soon after successful operation by a marked rise. Low urea excretion, with alimentary glycosuria and urobilinuria, imply a grave prognosis. Study of urea curves facilitates diagnosis between lesions of the appendix and the uterine annexa.

J. T. Case (Jour. Amer. Med. Assoc., Oct. 3, 1914) states that he has seen the appendix fluoroscopically in over 600 cases. He lays stress on a process of *antiperistalsis, demonstrated by roentgenograms,* showing the transfer of material from the descending colon and the hepatic flexure by a so-called "mass movement," clear across the transverse colon. Antiperistalsis is a very important factor in normal digestion. If it occurs, material in the colon will get into the appendix and even back into the ileum.

Appendicitis in Children, ii. 77.—According to Lanz (Zentralbl. f. Chir..

Nov. 28, 1914) *frequent and painful urination* in children may be an early sign of appendicitis. Also, *if a finger is introduced in the right inguinal canal the muscles contract about it* if the appendix is inflamed and the cord is found tender. There is relaxation of the sphincter ani muscle when the pouch of Douglas is being invaded.

In reporting on 200 cases in children under 13 years, Gray and Mitchell (Brit. Med. Jour., Feb. 21, 1914) state that 74 were chronic and recurrent, and 126 acute. Among the acute were 86 gangrenous cases, of which 45 had some peritonitis. The acute cases gave a mortality of 15 per cent. The classical symptoms were present in practically all cases, but frequently one of them predominated over the others. Diarrhea was prominent in 6 cases, 4 of which were fatal; in all 6 there was diffuse peritonitis. This type of case is likely to be mistaken for simple enteritis. Pain and *frequent micturition* characterized 4 cases. The *percentage of cases with diffuse peritonitis* is *much greater in children* than in adults, with gangrene and perforation in a large proportion. The omentum is likely to be very small and does not tend to limit the inflammation. Every case operated in the first 2 days of illness recovered.

F. L. Wachenheim (Arch. Pediat., xxxiii, 197, 1916) recommends high *palpation of the right iliac fossa by rectum* to elicit tenderness and pain in the McBurney region in children. The examining finger must be introduced quite painlessly. This can always be done if patience is exercised. The valuable diagnostic point is that the patient complains of no discomfort until the finger reaches the right iliac fossa, when a *sharp pain in* the *vicinity of McBurney's point* is elicited.

From observation of 6 cases of appendicitis in children 15 months to 4 years of age, V. Veau (Soc. de Péd., Paris; Quinzaine thérap., Feb. 10, 1914) concluded that such patients show no sign of localizing appendicular pain. Some scream and manifest violent anger; others seek to push aside with the hand something causing discomfort over the abdomen. Manifest tenderness in the right iliac fossa is not present. When light pressure is made over both iliac fossæ, the child will be seen to execute slight movements of the right leg. Under *heavy pressure*, the *right leg becomes rigid* and irregular movements of the left leg are executed. Often *the face* will be observed *suddenly* to *flush* when pressure is made over the appendix. Muscular rigidity is hardly perceptible. The prognosis is grave, as the child cannot keep still or withstand strict dieting.

Marvel (Arch. of Pediat., May, 1912) states that localization of the appendix tenderness in a distressed baby may be quite difficult. The acute attack is attended by distress, restlessness, vomiting, crying, and abdominal soreness. So do acute digestive disturbances; but in the *sleeping or restful moments, slight, and then greater, pressure over the abdominal surface* forms *the crucial test.* Rectal examination aids. Violent acute attacks often follow a chronic insidious preparation.

Appendicitis During Pregnancy, ii. 76.—W. L. Crosthwait (Texas Med. News, xxv, 337, 1916) observed 10 women who had had, prior to conception, repeated attacks of appendicitis. Six had recurrences in their first pregnancies. Four were operated early in the attacks, without any post-operative disturbances. In the others drainage was required. Perforation of the appendix and peritonitis during pregnancy are severe because protective *adhesions are less likely to form;* inflammation is more intense owing to the greater vascularity; the peritoneum of the upper abdomen is more often involved; the infection spreads under and around the uterus, and drainage is interfered with; *muscular rigidity and tympany* *predispose to pneumonia* and pleurisy; obstruction of the bowel is more apt to occur, especially in the later months. If an abscess becomes walled off, it is apt to rupture in labor. In operating between the first and fifth month a right rectus incision is suggested, to inspect the tubes. After the fifth month a higher incision and liberal drainage are advised. If abortion is inevitable the uterus should be emptied.

Retrocecal Appendicitis.—In this form there is generally, according to Basham (Interstate Med. Jour., July, 1914), *no pain nor tenderness at McBurney's point,* excepting that which arises from any intraperitoneal inflammatory process; *nor* is there, as a rule, *any rigidity of the right rectus.* The presence of an abscess does not always make the diagnosis easy if the mass is situated in the posterior wall of the peritoneum or outside the cecum. The post-cecal appendix often causes *pain* to be reflected outward *over the hip and upper part of the thigh* along the course and distribution of the lumbar nerves pressed upon as they cross the psoas muscle. The *superficial veins of the right side are usually prominent,* and commonly there is albuminuria. The differential diagnosis involves stone or abscess of the kidney, stone in the ureter, tumor of the lower pole of the kidney, gall-bladder disease, and obstruction of the bowel, especially due to neoplasm of the cecum or ascending colon. Exceptionally these cases begin as an acute gastroenteritis with no localizing symptoms. The constitutional symptoms and blood-picture of an active, virulent infection should lead to operation rather than waiting for a tumor or other unmistakable signs of right iliac trouble.

J. M. Jackson (Jour. Amer. Med. Assoc., Apr. 26, 1913) points out the difficulty of diagnosis of retrocecal cases is largely due to the absence of the characteristic symptoms of peritonitis and their possible disappearance after the onset. The *pain posteriorly above the crest of the ilium* is very significant. Rigidity and distention may disappear early or be lacking. The high temperature and rapid pulse are, of course, present, and may persist after disappearance of local symptoms. The leucocyte count is characteristic of pus infection and a negative Widal may be useful in excluding typhoid. W. W. Grant (N. Y. Med. Jour., Apr. 19, 1913) calls attention to a symptom of retrocecal appendicitis, viz., *tender point 2 inches above and on intersecting lines directed upward from McBurney's point and outward from the umbilicus.* In post-colonic appendicitis without preliminary symptoms, this is the most distinctly tender point. Prompt operation with drainage through the lumbar region will cure a large proportion of these cases.

Differential Diagnosis, ii. 82.—Douglas and LeWald (Jour. Amer. Med. Assoc., June 17, 1916) point out that a fecalith in the appendix as a rule is invisible by the *X-ray.* But if calcium salts are deposited on it through inflammation it may become demonstrable. A fecalith in the appendix may be mistaken for a *ureteral calculus.* The passage of an opaque ureteral catheter will usually help in making the diagnosis. Where doubt remains, a Röntgen examination, combined with an opaque meal or an enema, should be made. The writers call attention to the possibility of encountering a left-sided appendix due either to non-rotation of the colon or to complete transposition of the viscera. The former condition was encountered in 3 persons, and the latter in 12. A shadow on the left side may represent a calculus in the appendix unless the X-rays show the cecum to be on the right. Cabot (Jour. Amer. Med. Assoc., Oct. 9, 1915) referring to the differential diagnosis of appendicitis from *renal stone,* points out that in a case of nephrolithiasis in which the pain symptoms, X-ray evidence, and urinary findings are all negative is very unusual. A. Strauss (Surg., Gynec., and Obstet., Sept., 1915) points out that an *extraperitoneal appendix* is not uncommon. Disease of such an appendix may give a straightforward picture of appendicitis, or may stimulate *perinephritic abscess* or *psoas abscess.* It may cause a *subhepatic abscess* or a *fecal fistula.* Fetid pus from an abscess incised in the right lumbar region should suggest a diseased extraperitoneal appendix. G. Vilvandre (Arch. of Radiol. and Electrotherapy, July, 1916) states that in making diagnosis between *ureteral calculi* and calculi of the appendix, one should remember that ureteral calculi are situated more internally. An error is possible only when the appendix lies over the psoas and hanging over the brim of the pelvis, and is much elongated. Impacted gall-stones appear at a higher level. No added risk is entailed in radiographing just before operation. An advantage is that the appendix is localized and the surgeon need not hunt for it.

Persistent patent *Meckel's diverticulum* simulating appendicitis. Operation showed the presence of an abscess in a case seen by Glover (Lancet, Mar. 3, 1917), the localized tumidity and tenderness were located rather higher and nearer the middle line than usual. (See Diverticulitis, this Index.)

Homer Gage (Boston Med. and Surg. Jour., Aug. 26, 1915) reports 12 cases of acute *tuberculous inflammation of the ileo-colic glands,* with the symptoms those of acute appendicitis. In no case was a palpable tumor present. In some there had been a history of one or more previous attacks of appendicitis. The simulation is so close that a differential diagnosis is almost impossible. The appendix was usually removed, but no tubercle bacilli could be found in it. The infected glands were dissected out. The prognosis is good, only 1 case developing a tuberculous taint. J. Philipowicz (Wiener klin. Woch., Dec. 25, 1913) records 29 cases of appendicitis in patients between the ages of 51 and 72 years. In only 15 were the symptoms typical. In 4 cases the insidious onset, with emaciation and signs of *intestinal obstruction* in 3 cases, and even blood-stained stools in 1 instance, suggested *cancer of the large bowel,* but the trouble subsided after removal of the chronically inflamed appendix. In another case the only symptoms were from the stomach: emaciation, tenderness in epigastrium, hyperacidity and lactic acid, and doubtful X-ray findings pointed to *gastric cancer,* but all symptoms ceased after appendectomy, the chronic appendicitis having caused adhesions between the ascending colon and duodenum. Lieblein (Wiener klin. Woch.; Amer. Jour. of Surg., July, 1912) reports 3 cases of *lymphatic pseudo-appendicitis.* The appendices, upon removal, showed no histological evidences of acute or chronic inflammation, but there was marked swelling of lymphatic tissue, probably producing tension on the muscular coats and thereby causing pain. This condition occurs in young subjects of lymphatic habitus, and appendectomy gives prompt relief.

Winslow (Annals of Surg., Nov., 1915) reports 4 cases of diagnosis of *appendicitis in early typhoid fever.* In 3, pain, not fever, seemed the symptom which first attracted attention. There was a moderate leucocytosis in all. In none was the Widal reaction positive, but it became so later. In all cases the appendix was congested, but not acutely inflamed, with the large and small intestines hyperemic and the mesenteric and prevertebral lymph-nodes usually greatly enlarged. There is also less rigidity and tenderness in the typhoid cases than in genuine appendicitis. Headache is more common. Three of the 4 cases occurred in July and August. Care should be taken to ascertain whether the pain was sudden and severe, or developed after prodromal headache, malaise, and fever. If the abdomen is not markedly rigid, even though pain and tenderness in the right iliac fossa exist, and if the leucocyte count remains low, operation should be deferred until a clear diagnosis is reached.

Wolfsohn (Berl. klin. Woch., Aug. 16, 1915) reports cases with malaise for a number of days followed by obstinate diarrhea and pain in the abdomen suggesting *typhoid fever.* There was tenderness over the appendiceal region without rigidity. No typhoid bacilli were found in the stools, urine, or blood. Appendectomy was followed by prompt recovery. The appendix lesions were mild, but in several cases cultures of typhoid and paratyphoid bacilli were grown from the inner walls of the appendix, although absent elsewhere. These patients had previously received typhoid vaccine which apparently had rendered their tissues immune to the bacilli, with the exception of the appendix. Localization of *typhoid infection* may occur *in the appendix.* The diagnosis rests upon the symptomatology of appendicitis proper and that of typhoid, as well as the Widal test, according to F. Fazio (Gior. Intern. d delle Sci. Med.. Dec. 15, 1912).

De Quervain (Revue Méd. de la Suisse Rom., July, 1913), studying nearly 100 cases in which operation was done on an *erroneous diagnosis* of appendicitis, found that only in about 20 cases was no operation actually needed. In 7 cases the trouble was really *pneumonia.* Children are liable to vomit on the least excuse, run up a fever readily, and are inclined to locate at the umbilicus anything wrong within, and difficulty is added by the cases of *pneumococcus peritonitis* following pneumonia. In 3 cases *typhoid fever* was mistaken for appendicitis. Whenever general depression and headache cast doubt on the diagnosis of appendicitis, one should examine the blood for typhoid or paratyphoid bacilli. In 7 neuropathic cases the patients simulated the symptoms of appendicitis. One should be wary in accepting the diagnosis of appendicitis in women when the hymen is not intact. Accessory details may suggest a spontaneous criminal *abortion:* vagueness as to the date of the last menses, a worried expression, or exudation following slight pressure on the breast.

R. T. Morris (N. Y. Med, Jour., May 20, 1916) calls attention to a group of cases in which, though the appendix is a factor, the chief irritative lesions are *fibroid degeneration and syncongestive appendicitis.* A second, larger group, with symptoms in the appendix region, but not including the appendix, appears to depend upon a variety of *spinal irritative lesions,* with efferent impulses sent out both to the cerebrospinal nerves and sympathetic nervous system, and possibly to the automatic centers. Pressure about 1½ inches to the right of the navel and a trifle below, deeply enough to bring out the response from the right group of lumbar sympathetic ganglia, affords definite evidence that one is to look to the appendix for the source of irritation, provided the left group of sympathetic lumbar ganglia is not hyperesthetic. This point of tenderness situated several inches away from McBurney's point relates to a chronic irritative lesion of the appendix. Surgical judgment in addition requires one to determine if the patient is one with neurasthenic habit and relaxation of peritoneal supports with chronic enteric toxemia.

I. Collins (Nord. med. Arch., Stockholm, xlxix, Kirurgi, 5, 1916) referring to *appendicitis of extra-appendicular origin,* states that when an appendix, removed for suspected appendicitis, is found with mucous membrane normal and inflammation confined to its external layers, one should seek further for the cause of this exo-appendicitis. In the case of a female the genital organs must be examined; the incision already made being sufficient. Or the peritonitis may proceed from a perforated stomach or duodenal ulcer. The local symptoms of appendicitis, including pain and irritability of McBurney's point, are not manifest in exo-appendicitis until after the signs of an extended peritoneal affection are noted. In the differentiation of perforated ulcer and appendicitis, where there is doubt, it is best to do a laparotomy, bearing in mind that even a very advanced inflammation of the appendix may be of extra-appendicular origin.

Complications, ii. 111.—V. R. Braitzeff (Roussky Vratch, May 31, 1914) mentions a case of acute appendicitis in an old *inguinal hernia* in a man aged 50. Sudden pain and non-reduction of an inguinal hernia with patency of the intestinal tract strongly indicates acute appendicitis. Reduction in such cases is of course contraindicated. Veau (Bull. de la Soc. de Pédiat., May 5, 1914) operated for combined chronic appendicitis and *hernia* in 53 children. When a child has pains from an inguinal hernia, or undescended testicle, appendicitis should always be suspected. One may preferably operate separately on the hernia and the appendix, except in small children not in an acute stage.

J. E. Moore (Surg., Gynec., and Obstet., Mar., 1916) calls attention to cases in which a *salpingitis* occurs secondary to inflammation of the appendix, independent of the gonococcus or other extraneous organisms. In 2 illustrative cases infection of the tube undoubtedly took place from the peritoneal end from an old appendicitis.

W. G. Young (Jour. Amer. Med. Assoc., Jan. 29, 1916) reports a case in which gangrenous appendicitis was clearly due to constriction by a Jackson membrane. Difficulties were met in its removal owing to its posterior situation, and to its being buried beneath a pericolic membrane, plus an adherent cecum. Thirty hours after the primary operation the abdomen was reopened on the advent of general peritonitis; a *retrocecal abscess* was located and evacuated under local anesthesia. This was followed by *pleural involvement* and *infection of the liver.* Prompt treatment of the empyema, and drainage of the abscessed liver by the transpleural-thoracic route, were followed by recovery.

Cheever (Boston Med. and Surg. Jour., May 15, 1913) points out that in acute pelvic appendicitis, where the appendix has been torn from its bed on the pelvic wall, from brim to floor, symptoms of acute intestinal stasis, especially after a few days of normal convalescence, should lead to the assumption of an *acute angulation of the terminal ileum* at the pelvic floor. After elimination of ill-placed drains as a factor a secondary operation should be directed at that point, or, if the patient's condition does not justify this, an ileostomy performed. Wiegels (Münch. med. Woch., July 29, 1913) refers to 9 cases in which *ileus* followed appendicitis, in some after an interval of years.

R. N. Duffy (N. Y. Med. Jour., Aug. 21, 1915) points out that soon after the onset of appendicitis, toxins may make their way to the liver, mainly by the portal route, and set up a *toxic hepatitis.* The jaundice is rarely deep, and is usually limited to the conjunctivæ and facial skin. The thought of gall-bladder and bile duct involvement is dispelled by the fact that the tenderness is not over the gall-bladder, but at McBurney's point. The liver is rarely enlarged and but slightly tender. The urine is dark reddish-brown, due to urobilin, and may show albumin and casts. These findings usually indicate severe appendicular inflammation, yet the patient's symptoms may remain mild.

H. Neuhof (Surg., Gynec., and Obstet., Mar., 1912) writes on non-suppurative *subphrenic peritonitis* complicating appendicitis. Several days after operation there is a rise of temperature for which no cause is to be found in the wound, pelvis or lungs, with complaint of pain in the right lower chest, occasionally radiating to the right shoulder, and in typical cases, intercostal tenderness and rigidity in the seventh, eighth and ninth spaces, especially in the axillary zone. The pulse is relatively slow and the respirations normal. The blood shows marked leucocytosis. The affection lasts between 5 and 30 days. Aspiration of chest and subphrenic space is negative, but seems to have definite therapeutic value.

Mauclaire and Amaudrut (Arch. gén. d. Chir., vi, 33, 1912) refer to *infection of the iliopsoas muscle,* suppurative or non-suppurative, as a rare though grave complication of appendicitis. It seems related to an abnormal anatomical condition of the appendix, which, after traversing diverticulum situated under the iliac fascia, by its extraperitoneal extremity, comes into direct contact with the psoas muscle. In most cases the appendix is retrocecal. In 27 per cent. of 83 cases there had been one or more preceding attacks of appendicitis. In the commoner, grave form, with suppuration, the local symptoms indicate the formation of an abscess toward the tenth or fourteenth day of the disease. Death occurred in 27 per cent. of cases, notwithstanding operation, which should be prompt.

Bunts (Surg., Gynec., and Obstet., Dec., 1914) reports a case of *diverticulum of the cecum* following appendectomy. Nearly a year after operation the patient began to have renewed attacks of pain in the right side. Opening the abdomen, he found a distinct white ring at the appendiceal site in which the purse-string suture had been placed, but spread out to nearly ¾ inch in diameter. From this there protruded a conical pouch nearly 1 inch in length. By squeezing the cecum, he could force this to balloon with gas. It was pushed back into the cecum and a double row of purse-string sutures applied to close the opening. After the operation the pain had disappeared. Since then the writer has examined the cecum in all pelvic operations in which the appendix had previously been removed, and has found 2 more distinct cases, with widened ring and thin dilatable wall.

Delore and Martin (Presse méd. d'Egypte, May 15, 1912) report the case of a boy, aged 8, who had a slight attack of appendicitis. A mass in the right iliac fossa and a painful and tender lymphatic gland in the right groin were found. The boy kept the thigh flexed. Operation showed the appendix adherent by false membranes to the abdominal wall. Its end was perforated and surrounded by a mass of fungosities. Good recovery followed and the *lymphadenitis* rapidly disappeared. For the production of such a distant effect plastic peritonitis producing adhesions to the abdominal wall is necessary.

The possibility of *hematuria* during acute or chronic appendicitis, independently of any genitourinary lesion, is pointed out by Carlier and Leroy (Prov. Méd., xxvii, 102, 1914). In chronic cases hematuria may be the first and only symptom, occurring suddenly after a strain, sudden exposure to cold, etc. Pain simulating renal colic may or may not coexist. By an exploratory laparotomy the inflamed appendix is discovered, and after its removal the hematuria permanently ceases. The bleeding comes quite consistently from the right side. In 9 out of 14 cases the tissues about the ureter were inflamed.

Babler (Annals of Surg., lxi, 589, 1915) asserts that since the almost practical elimination of perforative peritonitis, the gravest complication of appendicitis is *pylephlebitis* with *multiple abscesses of the lung* or of the *liver.* The diagnosis rests on (1) the history showing that the appendix was the primary seat of trouble, (2) shifting of symptoms from appendix to hepatic region, (3) progressive increase in their severity, (4) repeated chills followed by high pulse rate and marked fever, (5) jaundice, (6) persistent pain in the hepatic region, (7) urinary and blood-findings, (8) change of liver dullness, (9) marked toxemia, and (10) absence of signs of extensive peritonitis.

Prognosis, ii. 95.—According to E. M. Stanton (N. Y. Med. Jour., Sept. 26, 1914) the following conclusions regarding the prognosis of acute appendicitis are now accepted by most surgeons: (1) The mortality in cases operated upon during the first 24 to 36 hours is almost *nil.* (2) Cases without peritoneal involvement localized to the immediate vicinity of the appendix can be operated safely at any period of the attack by a competent surgeon. (3) In cases with early peritonitis of greater or less extent the mortality rises rapidly in cases operated upon after the first day of the peritoneal involvement. (4) Late abscess cases should not be over 5 or 6 per cent. (5) The bulk of the operative mortality today occurs in the severe cases operated in the intermediate stage of the attack, when there is well-marked peritoneal infection of more than 24 hours' duration.

Wanner (Münch. med. Woch., June 23, 1914) reports 5 cases of acute *appendicitis during pregnancy* operated by him. In 1 case abortion occurred on the next day. The prognosis is worse the further pregnancy has advanced, as the cecum is drawn up and more apt to cause general peritonitis or infection of the fimbriated end of the tube and uterus with its contents, leading to general sepsis. The incision is best made with its center at the point of greatest tenderness. This may be high up, depending on the duration of the pregnancy. Drainage should rarely be employed. According to Findley (Jour. Amer. Med. Assoc., Aug. 24, 1912) the mortality of severe cases of acute appendicitis in pregnancy not operated on, is 77 per cent. In cases of all grades of severity, the mortality is but 6.7 per cent., if an operation is done in the first 48 hours.

Of 35 deaths among patients operated on by Burgess (Brit. Med. Jour., Feb. 24, 1912) after 48 hours the causes were: Shock, collapse or toxemia, 26; acute pneumonia, 4; pulmonary embolism, 1; sudden heart failure, 1; acute nephritis with uremia, 1; and intestinal obstruction, 2. Of 213 cases of circumscribed abscess with a total mortality of 4.64 per cent., the appendix was removed in addition to opening the abscess in 107, with a mortality of 1.86 per cent., whereas in 106 cases in which it was left the mortality was 7.54 per cent.

Etiology, ii. 85.—According to Hofheimer (Internat. Jour. Surg., Sept., 1915), the situation of the mouth of the appendix renders it liable to *distention by intestinal gases,* especially if under pressure, as in intestinal stasis from any cause. Thus dilated, it *readily admits particles* of fecal matter or other infective material, which the weak muscular coat is unable to eject. Waller and Cole (Surg., Gynec., and Obstet., xxi, 750, 1915), from fluoroscopic examination of 27 children, concluded that *fecal material normally retained in the appendix* from one digestive period to another, provides bacteria for colonic digestion, the appendix being thus a physiological "culture tube." Frequent occurrence of appendicular involvement in healthy children was revealed by the examinations. The writers believe appendicitis essentially a lesion of early life.

R. H. Fowler (Long Island Med. Jour., Dec., 1914) asserts that *foreign bodies* are present in the appendix in about 2½ per cent. of operated cases. More than 52 per cent. of them *pins.* The habit in infancy and childhood of placing everything in the mouth seems responsible for about one-third of the pin cases, but a history of having swallowed the pin is rarely elicited. Appendicitis with foreign bodies is more often chronic with recurrent attacks than acute. In most cases there is no reason to ascribe perforation directly to the pin. F. W. Hitchings and H. G. Sloan (Jour. Amer. Med. Assoc., Apr. 25, 1914) observed the case of a young woman who had taken a large quantity of *bird-shot* to cure "Cuban itch." The following lead-poisoning was almost fatal. Several months later she took again, for another eruption, a large tablespoonful of BB shot. Abdominal tenderness became worse, acute appendicitis was diagnosed, and the appendix, containing 8 bird-shot, removed. About a week later, she passed over 40 more, and a roentgenogram later revealed no more in the abdomen. Grondahl (Norsk Mag. f. Laegevidenskaben, Dec., 1915), among 400 operations on the appendix found a foreign body in 10 cases. In 6 there was a living *oxyuris,* 4 of these patients being girls between 6 and 17. In other cases the foreign body was a *hair,* part of the head of an *oat,* a *sliver of wood,* a *grapeseed,* a *blackberry stone* or *small shot.* One girl of 15 had had vague pains in the region for 7 months, but no tenderness; a hair was found in the tip of the appendix. In only 2 of the 5 oxyuric cases was there evidence that the helminths had caused the inflammation. Foreign body cases are apt to be mild unless the body is a sharp piece of metal or enamel, which is dangerous anywhere throughout the intestines.

The pinworm is a comparatively common cause of appendicitis. Rheindorf (Med. Klinik, Apr. 20, 1913) reporting 13 cases of appendicitis in persons harboring the *oxyuris* (*pinworm*), concludes that chronic discomfort in the appendix region in adults, especially sharp pains, increasing during exercise, should suggest the possibility of oxyuris infection. Even without signs of the parasite in the stool, a course of treatment for helminthiasis should be given, to be stopped at once if signs of acute febrile appendicitis develop. Suzuki (Surg., Gynec., and Obstet., Dec., 1915) found that in the appendix oxyures may be harbored, not only in the lumen, but also in the mucosa and submucosa, without producing any clinical symptoms or noteworthy anatomical changes. In the majority of cases the presence of oxyures in appendicitis, whether chronic or acute, is purely accidental. Yet a true inflammation can be provoked by the parasites when the latter have penetrated the wall of the appendix in large numbers, "appendicitis oxyurica." Among 103 surgically extirpated appendices this type was encountered but once. Again a non-inflammatory but pain-producing morbid condition of the appendix is sometimes caused by the oxyuris, in which case traumatic destruction of tissue accompanied by hemorrhage can always be demonstrated. Three such cases were found in the series.

In 10 years there were only 75 deaths from appendicitis, typhlitis, or perityphlitis recorded in all of the insane asylums of England and Wales, according to Briscoe (Brit. Med. Jour., July 20, 1912). This extremely low incidence, compared to the general incidence, is ascribed to the fact that in these institutions *constipation* is not allowed to occur. The bowels are carefully watched and a laxative given at the first appearance of sluggishness. In addition, the diet is very simple, and obviates intestinal fermentation.

F. Lejars (Semaine méd., July 29, 1914) points out that in cases of undescended cecum, the appendix may assume most *peculiar shapes and positions,* for example, kinked, rolled around the termination of the ileum, etc. Such abnormal positions are capable of causing appendicular pain without actual appendicitis. Basil Hughes (Brit. Med. Jour., May 29, 1915) presents evidence to show that appendicitis is due to a rotation of the appendix on its mesentery, plus secondary infection from the organisms always present in its lumen.

The factors leading to *torsion* of the appendix are a movable cecum and loss of tone of the abdominal muscles with resulting constipation and overloading of the cecum.

The frequency of *adhesions* of the cecum, sigmoid, and appendix after gynecological laparotomies were studied by Opitz (Deut. Gesellsch. f. Chir., 1914; Surg., Gynec., and Obstet., May, 1915). Among 160 cases, the appendix was free of adhesions in only 70 cases, the cecum in 36, and the sigmoid in 20. Congenital peritoneal adhesions did not appear in more than 20 per cent. of the cases. Microscopic examination of 100 "stolen" appendices revealed that of 99 appendices only 20 were normal, 43 showing signs of old changes, mild in degree, and 31 signs of severe phlegmonous or ulcerous processes, although the history showed no previous attack of appendicitis. Diseases of the appendix are usually secondary to disease of the colon. The transmission takes place by infectious intestinal contents penetrating the appendix and being held there for some time. Nervous disturbances are also involved, either directly from irritation of the vegetative nerves by adhesions, or by absorption of toxins, causing circulatory disturbances in the appendix.

Infection from *disorders of the upper respiratory tract* is increasingly being incriminated. S. C. McCoy (Lancet-Clinic, July 15, 1916) points out that the clinical relationship of appendicitis and *tonsillitis* does not depend for its acceptance on the theory of a hematogenous origin. Chastenet produced appendicitis in rabbits by feeding pathogenic bacteria; the possibility of infection from the tonsil by way of the alimentary tract is, therefore, apparent. Ponyton and Paine (Lancet, Aug. 17, 1912) report a case of appendicitis in which inflammation of 1 of the tonsils coexisted. From the appendix fluid and from the tonsil they isolated the same organism, a streptodiplococcus. This organism induced arthritis in rabbits, and in one caused an acute appendicitis. In the appendix the diplococci were found in the mucous and submucous membranes, though far more numerous in the serosa. The condition of the human appendix was a counterpart of that found in the rabbit. This proves that appendicitis may result from streptococcal invasion through the blood-stream from a follicular tonsillitis. Anderson (Amer. Jour. Med. Sci., Oct., 1915) points out that in appendicitis following acute tonsillitis, the appendicular involvement may be only part of a generalized infection; hence the gravity of such cases is out of proportion to the local symptoms. They are apt to be atypical in course, and after smouldering to suddenly develop fulminating symptoms. Chronic tonsillar infections should likewise be borne in mind as the possible cause of appendix infections. Local tenderness and rigidity in the right iliac region are in rare cases wanting in acute appendicitis.

Lanz (Münch. med. Woch., Aug. 20, 1912) mentions 3 instances where an *epidemic streptococcic sore throat* was followed by 2 or 3 simultaneous cases of appendicitis in the same family. The streptococcus was cultivated from the appendix. Prophylactic purging in every case of febrile sore throat is urged. Appendicitis following the latter, or of traumatic origin, seems to show a special tendency to gangrene. Rosenow and Dunlap (Jour. of Infect. Dis., Apr., 1916) report 8 cases of acute appendicitis developing within 12 days in conjunction with 34 cases of *parotiditis* within 3 months. Several appendices were examined bacteriologically and all showed streptococci, some in almost pure growth. Streptococci were found in milk used by these patients and these germs when inoculated into rabbits, caused appendicitis in some and parotiditis in other animals.

Bennett (Brit. Med. Jour., Mar. 17, 1917) observed a case in which infection of the appendix originated in an acute inflammation of the fauces and pharynx, being conveyed by the blood-stream.

Markoe (Bull. Lying-In Hosp., City of N. Y., May, 1917) observed a case of appendiceal abscess in which the infection probably came from the roots of the teeth, the culture from the pus evacuated from the peritoneal cavity having been pure culture of *streptococcus viridans.*

Pascale (Berl. klin. Woch., Dec. 16, 1912) calls attention to the *peculiar arrangement of the vessels* to the appendix, which differ from that of all other intestinal segments. Any slight interference with the circulation blocks it at once so that even a minimal disturbance is apt to have serious consequences as regards the appendix.

Among 946 appendicitis cases operated on in Finland, Backman (Finska Lakare. Handl., lviii, No. 6, 1916) found in 21.6 per cent. a *familial predisposition* to the disease. A *nervous or tuberculous taint* was evident in 50 per cent., and only 8.4 per cent. could be classed as robust. *Dyspepsia* had been noted in 51.6 per cent. of the destructive and in 58.8 per cent. of the catarrhal cases. *Gastroptosis* was found in 34.7 per cent. of the severe cases in men and in 79.7 per cent. in the women; in the catarrhal cases, in 55.2 per cent. of the men and 77.7 per cent. of the women. The well-to-do were affected more than the working classes. *Chronic constipation* was a factor, but there was no connection with acute enteritis or colitis, acute infectious disease, or the seasons.

Bacteriology, ii. 90.—Rosenow (Jour. of Infect. Dis., Mar., 1915) made cultures from the appendix in 14 cases of acute appendicitis and 6 of chronic. Streptococci, usually in predominating numbers, were isolated from the tissues of the appendix in 17 cases. The colon bacillus was found in pure cultures in the pus within the lumen in 6 cases and with streptococci or other organisms in the rest. The cultures from the wall, after thorough washing, showed that here the chief bacteria were streptococci. The fusiform bacillus was isolated from the wall of the appendix in 3 cases. Other anaerobic bacilli and spirilla were found in some cases; the bacillus welchii in 2; a diphtheroid bacillus in 2; the staphylococcus aureus in 1; the bacillus pyocyaneus in 1, and unidentified cocci and bacilli in 2.

In experiments in which Mordvinkin (Roussky Vratch, May 21, 1916) injected staphylococci into the blood of rabbits, he found that the normal appendix proved able to eliminate the bacteria derived from the blood, passing them into the intestines without harm if the appendix was permeable. But if it was obstructed, the staphylococci from the blood soon set up inflammation in it, with complicating peritonitis. Widal, Abrami and Weissenbach (Bull. de l'Acad. de Méd., Oct. 22, 1912) report a case in which, after typhoid fever had existed 2 weeks, in the course of which a pure culture of *B. paratyphosus* had twice been obtained from the blood, appendicitis of fulminating type appeared, with death in 24 hours. The cultures had been made 4 and 2 days, respectively, before the appendicular symptoms began. At autopsy the small intestine was found normal, but the appendix was swollen and soft, with 2 necrotic areas, of which 1 had perforated and lead to peritonitis.

Pathology, ii 90.—An examination of 1500 specimens led Moschcowitz (Annals of Surg., June, 1916) to conclude that there is no pathological evidence that an acute catarrhal appendicitis occurs, nor is there evidence of "involution" or of "chronic catarrhal" inflammation of the appendix. The only justifiable classification of inflammation of the appendix is: (1) Acute appendicitis; (2) healing or subacute appendicitis; (3) healed or chronic appendicitis. Acute localized peritonitis is always present in acute appendicitis as early as

12 hours after the onset; the absence grossly of a localized peritonitis in suspected cases is *ipso facto* evidence of absence of acute appendicitis. In addition to obliteration and stricture, attention is called to 2 new, constant and pathognomonic signs of chronic appendicitis, namely: (1) absence of mucosal crypts, and (2) marked widening of the submucous connective tissue zone. The latter is especially easy to determine in cross sections.

A painstaking microscopic examination of 539 appendices removed during or within 10 days after an acute attack, together with the gross pathology in over 500 cases by Stanton (Amer. Jour. Med. Sci., Apr., 1915) showed that during the first 24 hours of an attack the pathological changes are similar in nearly all cases, a definite obstruction of the lumen of the appendix being always present, distally to which the organ is distended. Following on the first 8 or 10 hours, fibrin is found on the peritoneal surface, and toward the close of the first twenty-four hours a considerable proportion of the appendices show commencing gangrene macroscopically. Surgically, the peritoneal involvement of the first day may be ignored and the abdomen closed without drainage. On the second day, owing to coalescence of microscopic necrotic areas, macroscopic areas of gangrene are noticeable, and perforation, if it is going to occur, usually takes place on this day. In the majority of cases there is now a definite fibrino-purulent exudate on the peritoneal surface. By the third day destruction has usually reached its maximum, evidence of commencing repair now appearing in the presence of fibroblasts in all sections. On the fifth day in the non-gangrenous cases, the polynuclear leucocytes have almost disappeared. Protection of the peritoneal cavity in appendicitis depends upon maintenance of the fibrous periappendicular adhesions rather than upon the bacterial impermeability of the appendicular walls. The writer agrees with Deaver, Moynihan, Ochsner and others that clinical perforation would almost never occur if the practitioner and laity would appreciate that in appendicitis "perforation spells purgation" and withhold cathartics during the early stages of suspected cases.

A report of 6 cases of *self-healed appendicitis* discovered during operations for utero-ovarian conditions was published by Deppe (Münch. med. Woch., Dec. 3, 1912). In some of these there was no history pointing to appendicitis. In 2 hardly any appendix remained (autoamputation); in 2 others it was adherent to the abdominal or pelvic wall, no longer inflamed, and sealed up by the peritoneal inflammation around it. In the remaining 2 cases no trace of an appendix could be found, though there were scars in the cecum at the point of insertion. A gangrenous appendix had evidently sloughed and been slowly absorbed.

Deaver (N. Y. Med. Jour., Feb. 5, 1916) classified *appendicular abscesses* as follows: (1) in front of, below, and outside of the cecum, the pus being confined by the cecum, small bowel, omentum, etc.; (2) outside the cecum and ascending colon or behind the cecum in the layers of the mesocolon; (3) in the pelvis; (4) near the median line to the median side of the cecum; (5) free in the abdominal cavity or in many pockets between the coils of intestines. In addition there are seen secondary abscesses, close to the original abscess, residual abscesses at the site of the primary abscess; and metastatic abscesses at any distal point or as a parotid abscess, pylephlebitis, etc.

According to C. E. Cantrell (Pan-Amer. Surg. and Med. Jour., Feb., 1915), *appendicitis in the female* is less likely to lead to general peritonitis than in the male, but if chronic and recurrent, is very prone to lead to damage to the female pelvic organs, varying from slight chronic pelvic peritonitis to cystic degeneration of the ovaries, fibrous closure of the Fallopian tubes, or general pelvic adhesions with all their symptoms and discomforts, including absolute sterility. The physician should urge removal of the appendix in every young woman when there is any inflammation of it, preferably during a quiescent interval.

In a series of cases of *appendicitis in children,* M. B. Clopton (Pediatrics, xxvii, 271, 1915) states that 9 per cent. occurred in the first 5 years of life, 54 per cent. between 5 and 10 years, and 37 per cent. between 10 and 15. The important feature of appendicitis in children is *early gangrene.* A third of the cases were gangrenous throughout or in part and perforation accounted for the peritonitis in another large group. Only one-third of the cases were uncomplicated acute inflammations permitting closure of the wound without drainage. The appendix was retrocecal in 30 per cent. Several times a half twist of the meso-appendix was found, probably a factor in the stasis causing gangrene. Twice there was definite history of trauma. Fecal concretions were found in a fifth of the cases; pin-worms, in 3 cases. Comparison of results of operation in adults and children showed the better figures for the children. The author's mortality was less than 4 per cent. in children.

medical treatment of, ii. 98

Beverly Robinson (Med. Rec., Mar. 22, 1913) states that for travelers in *localities lacking experienced surgeons* and hospital facilities, the essential features of medical treatment in appendicitis are dorsal decubitus, liquid food, enemas of warm water, egg yolk, and sweet oil, warm flannels wrung out of alcohol and water and applied to the belly, covered with rubber tissue, and renewed when dry, and codeine tablets 1/10 grain (0.006 Gm.) every 2 hours until pain is notably less, then less frequently. Transport from the bed or sitting up is forbidden so long as pain continues. Cracked ice and good brandy (a teaspoonful frequently) will relieve nausea or weakness. Strong broths or milk alternately or mixed together (1 or more ounces every 2 hours) should be given when prostration exists.

abstinence from food and purgatives in, ii. 99, 102

In acute appendicitis H. A. Bruce (Can. Med. Assoc. Jour., May, 1912) has found that even though perforation ensues, if purgatives are not given and absolute starvation is enforced, diffuse peritonitis does not as a rule supervene, a localized abscess usually developing. This fact affords the best indication for treatment: At the onset all food by mouth should be withheld, to arrest peristalsis and reduce virulence of the bacteria. No purgative should be administered, and even the giving of fluids, which must reach the cecum to be absorbed, should be avoided. Sorge (Therap. Monats. Mar., 1913) noticed cases with *perforative lesions* in the appendix *were invariably those in which castor oil had been taken recently.* Nearly all the patients stated that soon after taking the oil pains had set in with great intensity.

bacterial vaccines in, ii. 368

The colon bacillus and streptococcus vaccines are recommended by W. W. Crawford (So. Med. Jour., June, 1912) in acute appendicitis in conjunction with operative treatment, 2 g. 50,000,000 dead colon bacilli on the first day, 100,000,000 on the second, 200,000,000 on the third, and 400,000,000 on the fourth. Many of his cases with tumor and fever either passed rapidly into the "cold" stage, where simple drainage, or drainage with appendicectomy, became possible, or, when suppuration was slight, convalesced without drainage. In acute perforative appendicitis, if operated upon early, liberal doses of vaccine are helpful unless the patient is already overwhelmed with toxins. A. C. Guthrie (Brit. Med. Jour., Jan. 9, 1915) employed anticolon-bacillus serum and vaccine in 22 cases, which recovered without operative measures. Most of the cases were acute. The best dosage was 20 c.c. (5 drams) of anticolon-bacillus serum, 10 c.c. (2½ drams) being injected subcutaneously first in the right and then the left hypochondriac region. A few days later 100 million colon-bacillus vaccine is injected in the deltoid region, to prevent recurrence. As other organisms may be causative, the "fixation of complement test" should be tried, using the patient's serum and the most probable organism (*B. coli*, pneumococcus, streptococcus). A corresponding serum or vaccine is then used. A striking relief of pain and a feeling of well-being followed the serum injections.

cloths wet in ice-water in, ii. 104
dry cups to the right lower abdomen, ii. 102
ice-bag in, ii. 104; iii. 530

A. M. Fauntleroy (Med. Rec., Aug. 3, 1912) in a parallel series of cases, gained the impression that in cases in which the ice-bag was applied, the acutely inflamed appendix was less walled off from the general peritoneal cavity than those in which the hot water bag or morphine was used prior to operation. The leucocyte count was also much lower, showing that the reactive processes were deficient. The ice-bag should, therefore, not be used in appendicitis.

lavage in, ii. 99, 100
light therapy in, vi. 360
local anodyne measures in, ii. 104
Murphy method of proctoclysis in, ii. 100
Murphy-Fowler method in, ii. 102
nutrient enemata in, ii. 99
Ochsner's method in, ii. 99, 100
opium in, ii. 104
pneumococcic vaccine in, ii. 333
potassium purgative salts in, vii. 579
rectal feeding in, ii. 102
rhamnus purshiana in, vii. 822
saline solution in, ii. 100, 102
starvation treatment in, ii. 100
stomach lavage, ii. 102

Appendicitis, acute, medical treatment of (*continued*).
vaccines in, ii. 333, 368
water by rectum in, ii. 99
surgical treatment of, i. 59, 74, 82, 83: ii. 105, 107, 108, 110

Preoperative Measures, ii. 105.—Deaver (N. Y. Med. Jour., Feb. 5, 1916) makes the following recommendations: (1) examine the patient thoroughly and not through the clothes; (2) give no aperient; (3) 1/12 to 1/16 grain (0.005 to 0.004 Gm.) of morphine will not mask the symptoms and may be safely given when the pain is severe; (4) the diagnosis having been made the proper measure is immediate operation. In the presence of peritonitis and in the absence of operation, set the patient up in bed, give nothing by mouth, place an ice-bag over the tender area, and institute enteroclysis. Operate in the cases of localized peritonitis where the lesion can be localized and there is peristalsis in the surrounding region of the abdomen. In diffused peritonitis defer operation until the peritonitis becomes a localized or localizing one.

As preoperative treatment T. A. Kenefick (N. Y. Med. Jour., Nov. 7, 1914) finds that a combination of 20 grains (1.3 Gm.) of acetyl-salicylic acid with 1 grain (0.06 Gm.) of calomel and 5 grains of sodium bicarbonate, given in 2 to 4 ounces (60 to 120 c.c.) of water on the afternoon preceding operation, followed by the usual enema next morning, yields good results in relieving gas pains after appendectomy. The drug can be given alone if calomel is objectionable. If percussion later suggests beginning distention, 10 grains (0.6 Gm.) can be given next day, soon causing relaxation.

Rational preoperative treatment according to F. G. Dubose (Southern Med. Jour., ix, 332, 1916) is a most important factor in the result of operation. Before late operations, the stomach should be emptied and kept empty, the large bowel cleansed with enemata and prepared for proctoclysis, **morphine** in sufficient quantities given, **Fowler's position** used, and proctoclysis of 15 per cent. **glucose**, 1 per cent. **sodium bicarbonate**, and 0.5 per cent. **sodium chloride** given. *After operation*, essence of **pepsin**, 1 teaspoonful to a quart of water, is administered per rectum to relieve gas. **Pituitrin** is used for distention after the third day. **Milk and molasses**, equal parts, form the safest efficient purgative **enema. Glucose and soda** intravenously make an ideal heart-muscle stimulant, nutria and eliminant.

appendectomy in, i. 59, 74, 82, 83; ii. 105, 107, 108, 110
  beta-eucaine infiltration anesthesia in, iv. 702
  cocaine anesthesia in, iii. 484
  iodine tincture disinfection in, vi. 33
  novocaine anesthesia in, vii, 103

Wiener (Jour. Amer. Med. Assoc., Apr. 8, 1916) operated 15 cases of appendicitis under local anesthesia, with very satisfactory results. Fibrinous adhesions are not sensitive. Omental adhesions can be readily anesthetized with a few drops of local anesthetic. A few of the cases were acute. Half an hour before operation ¼ grain (0.016 Gm.) of **morphine** is given. A 1 per cent. solution of **novocaine** to an ounce (30 c.c.) of which 20 drops of a 1:1000 solution of **epinephrin** are added, is generally used. As much as 240 minims (15 c.c.) of this can be safely used for an adult, but the author has never had to use this much. The muscle splitting McBurney incision lends itself well to the local anesthesia operation. The solution is first injected into the skin along the cut and then more deeply. The skin and subcutaneous tissues are painlessly incised down to the aponeurosis of the external oblique with a sharp scalpel. The novocaine is then injected under the aponeurosis and after 2 minutes this is divided. It is next injected into the internal oblique, and after another wait of a few minutes this is incised. Then a little is injected under the peritoneum and it is divided in 3 minutes more. When the cecum with the appendix is exposed some novocaine is injected into the mesenteriolum to prevent cramp-like umbilical or epigastric pains. After 3 minutes the appendix can be pulled out of the abdomen, the mesentery ligated and divided, and the appendix removed with almost no pain. Peristalsis returns early. The patients are usually able to get out of bed on the fourth day and leave the hospital on the seventh or ninth day.

  Schleich's infiltration anesthesia in, iii. 497, 499

Early Operation.—An editorial writer (Lancet, May 16, 1914) points out that the number of adherents to the plan of immediate operation is steadily increasing. Many surgeons who believe it not unsafe to delay operation while the patient is kept under observation have been compelled to change their views by cases developing without warning a general peritonitis. In 1133 operated cases of appendicitis W. D. Haggard (So. Med. Jour., Nov., 1915) had a mortality of 2½ per cent., all the fatal cases being perforative, with spreading peritonitis. Practically every case with perforation and gangrene gave a history of having received catharsis. The ice-bag is described as a curative agent.

A study of the results of an analysis of 822 cases of acute appendicitis submitted to operation by P. F. Morf (Jour. Amer. Med. Assoc., Mar. 24, 1917) emphasizes the importance of operating before general peritonitis develops. Of the 445 patients operated upon for simple acute appendicitis, only 5 died, giving a mortality of a trifle over 1 per cent., while in the cases with peritonitis, 58, there were 17 deaths, *i.e.*, 34 per cent. Of the 266 patients with suppuration, gangrene, or perforation, and abscess, only 6 died, a mortality of 2.2 per cent. In the 127 patients with gangrenous appendicitis without abscess formation, the mortality was 5.5 per cent.

Deaver (N. Y. Med. Jour., Feb. 10, 1912) asserts that, as a rule, the cases of acute appendicitis which should not be operated on immediately are those with diffuse peritonitis, usually but not necessarily of more than 48 hours' duration. These, if rigidly treated by **rest, proctoclysis, absolutely nothing by mouth,** with **lavage** if necessary, the **sitting position,** and the **ice-bag** or **ice-coil,** with few exceptions end in recovery from the spreading peritonitis. The localization of the mischief thus allows of operation, which should then be done immediately. The localization of a peritonitis in the presence of a definitely located appendix does not contraindicate immediate operation in cases in which the appendix is centrally located; here, it may be wise to wait until the peritoneal process has become entirely localized. In abscess formation the peritoneal cavity should not be opened as a preliminary step to evacuation of the abscess. The appendix should not necessarily be removed in every case of appendicular abscess; in nearly all cases, however, this is readily done without increased risk.

Incision, ii. 105.—Brickner (Amer. Jour. of Surg., Jan., 1915) points out that while the *McBurney incision* is satisfactory for a simple appendectomy, it is not suitable for the exploration of the upper abdomen so often indicated, nor does it lend itself to enlargement. Its routine use leads to otherwise avoidable technical difficulties, and conditions may be overlooked which would be observable through the right rectus incision.

The *low gridiron incision,* with, when necessary, Harrington's extension, is deemed by H. A. Shaw (Northwest Med., xv, 155, 1916) to be the ideal one. The center of the incision should be about 1 inch lower than McBurney's gridiron incision, (1) because the most difficult part of the operation is the delivery of the appendix without rupture, and (2) the less danger to the twelfth thoracic nerve. The external oblique may be cut transversely in an emergency. In the presence of infection, this means added danger of hernia. In chronic cases, those within the 24 hour period, those where the tumor mass is central, or when there is doubt whether the lesion is appendicular or pelvic, he found mediolateral incision most practical in over 1000 cases.

A *transverse incision* is advocated by A. E. Rockey (Jour. Amer. Med. Assoc., Sept. 11, 1915) in appendicitis. It is made directly transverse with its center at or near McBurney's point. In ordinary cases it should be 2 or 2½ inches in length. It passes through the outer part of the sheath of the rectus, severing the tendinous border and the aponeuroses of the muscles transversely. Then the handle of the scalpel may be inserted below and the finger above and the wound spread wide open. Not a muscle fiber is cut, the fibers of the internal oblique and transversalis being separated transversely. The aponeurosis of the external oblique is broader than that of the other muscles, thus permitting the incision through this to be carried further to the outer side.

Where the diagnosis of appendicitis is not absolute, it is usually best to make a right rectus incision; if a gangrenous appendix is suspected and drainage is necessary a small gridiron incision can then be made near the anterior superior spine just where the drain is to be inserted directly down to the cecum. William Neill, Jr. (Jour. Amer. Med. Assoc., Jan. 23, 1915) praises Cullen's method, viz., folowing the longitudinal band on the cecum.

Operative Technique, ii. 105.—A series of 110 cases of appendicitis, operated without mortality, was reported by W. B. Brinsmade (Annals of Surg., Nov., 1914). When free pus is present with extensive peritonitis, he sponges it out whenever seen.

One or 2 long retractors are then passed into the pelvis and the patient tilted to the right side, allowing removal of pus without passing sponges into the pelvis. No attempt is made to investigate. One or more drains are placed in position and the wound partially closed. Soft rubber drains or iodoform gauze covered with green gutta percha are employed. No rubber tubing or gauze is left in contact with the intestines. In cases with marked vomiting or with free pus and extensive peritonitis, the stomach is washed in the operating room as soon as the binder is put on. The **Murphy drip** is used in a large proportion of cases. One dose of ¼ grain (0.016 Gm.) of **morphine** is given if pain is severe, with a second dose of ⅛ grain (0.008 Gm.) if necessary to insure a comfortable night. Nothing is allowed by mouth, even water, for 24 hours in the severe cases. After 36 or 48 hours, a low enema is given; if satisfactory, no further attention is paid to the bowels for 24 hours, when 1 dose of 3 grains (0.2 Gm.) of **calomel** and 10 grains (0.6 Gm.) of **sodium bicarbonate** is given, followed in half an hour by a **seidlitz powder.**

This excellent record is surpassed by R. B. Williams (Surg., Gynec., and Obstet., Feb., 1916), who reports 324 consecutive cases of appendicitis operated on at the Naval Hospital at Norfolk, Va., without a death. Of these, 183 were acute and 141 chronic, interval operation being included in the latter. Immediate operation was done in all cases with acute symptoms.

A warning is published by Secord and Coates (Can. Med. Assoc. Jour., vi, 421, 1916) against the impression that appendix cases should not be operated upon after the third day unless or until a localized abscess has evidently formed. An inflamed appendix should be removed immediately, no matter what day of the disease. Fever is by no means a constant symptom of a gangrenous appendix or localized peritonitis. Inversion of the appendiceal stump is opposed by the author, the stump being a potential source of infection, and the general peritoneum being better able to deal with it than the tiny sac of peritoneum with which it comes in contact after application of a purse-string suture. Inversion of the stump without primary ligation is inadvisable also, because of the danger of hemorrhage. In all pus cases immediate use of a stock mixed infection **vaccine** is urged. The **Fowler position** and **Murphy drip** are also used, and, if post-operative ileus is feared, injections of **eserine.**

J. Shelton Horsley (Trans. So. Med. Assoc.; N. Y. Med. Jour., Apr. 21. 1917) objects to burying the *stump* for the following reasons: 1. It is more complicated than the simple ligation of the appendix, an intestinal suture being used in addition to the ligature. 2. The pursestring suture cuts off some of the blood-supply which would otherwise go up to the ligated stump and assist in healing. This also diminished the resistance of the tissues. 3. It places a piece of necrotic tissue, the stump, in a closed cavity, and shuts it off from the omentum which would not only help to absorb the stump, but would also be a safeguard against infection. 4. By burying the stump and cutting off some blood-supply, a greater hyperemia is caused than when the stump is simply ligated; consequently, the adhesions that occur are more likely to be permanent, for when the stump adheres it is absorbed. 5. It offers an excellent place for abscess formation, having most of the requisites, *i.e.*, a closed cavity, diminished blood-supply, a piece of necrotic tissue, and being almost totally surrounded by fecal contents of the cecum. 6. It tends to leave a permanent lump in the bowel wall, which will be a constant source of irritation and a possible starting point for cancer.

Where more than 48 hours have elapsed between the onset of acute appendicitis and the time when the surgeon is called, F. G. Dubose (Southern Med. Jour., ix, 332, 1916) asserts that immediate operation is imperative (1) if all symptoms become exacerbated in spite of starvation-rest treatment; (2) if there be sudden relief of pain with subjective betterment but with a quickened pulse-rate indicating rupture, abscess, or thrombosis; (3) if a circumscribed swelling appears in the right abdomen (evidence of localization by adhesions); (4) if the previously high leucocyte count falls suddenly or gradually, with steady increase in the polymorphonuclears; (5) when more than 1 week has elapsed since the onset. Operation should be deferred, from the third to the seventh day after onset, as long as the patient shows improvement under the starvation-rest treatment, and in the presence of a high polymorphonuclear count without corresponding leucocytosis.

Bull (Norsk Mag. f. Laegevid., July, 1912) analyzes 22 cases of *thrombosis* and *embolism* following 188 laparotomies for appendicitis. Palpable thrombosis did not develop until the fifth to the thirty-fourth day, but pulmonary embolism developed on the second to the seventh day in 9 cases, and in the second or third week in 6. Nine of the 15 patients with pulmonary embolism had more than 1 attack. The percentage of embolism among 88 women was 15 per cent. and among 100 men only 9 per cent. Thrombosis and embolism do not occur after appendicectomy in children nor does thrombosis develop in appendicitis, given exclusively internal treatment. It seems to follow clean laparotomies just as often as the infected. The left femoral vein is affected oftener than the right. In the 2 fetal embolism cases necropsy revealed the thrombosis in the pelvic veins. The occurrence of embolism on the second, third and fourth days shows that early rising after laparotomy will not always ward it off. **Morphine** is urgently indicated in acute embolism, insuring needed repose. Stimulants are not necessary, as death is not cardiac but pulmonary.

Abscess, ii. 111.—As soon as the patient is suspected of appendicitis he should be placed upon a proper stretcher, with his head elevated, and should be kept lying inclined to the right side so that in case rupture of the pus sac takes place the upper region of the abdominal cavity will be protected from the pus. Southgate Leigh (N. Y. Med. Jour., May 20, 1916) considers delay in operating is often advisable, if the condition of the patient permits, when he is fatigued from the journey. But where all conditions are favorable operation as soon as possible after proper diagnosis is advisable.

F. C. Warnshuis (Lancet-Clinic, Sept. 9, 1916) has observed patients with gangrenous, purulent, or perforative appendicitis refer to *chills or chilliness,* experienced at the very beginning or in the first few hours of the attack. In cases with history of such a chill he urged operation as more imperative, and anticipates drainage as being necessary. Where an ice-bag or cold had been applied before operation there was noticed a lack of effort on the part of nature to wall off the appendix, which was frequently much congested, perforated or gangrenous. Where a **hot water bag or moist heat** had been employed a greater attempt toward walling off was manifest. *Acute pain stopping in 24 to 48 hours,* with *marked rigidity,* suggests gangrene or acute stasis and is often followed in 12 to 24 hours by sudden pain indicating perforation. Temperature and pulse rate are untrustworthy as indicators of safety.

Uniform removal of the appendix at the first operation in appendicitis with localized abscess is advocated by Van Buren Knott (Jour. Amer. Med. Assoc., Jan. 31, 1914). In a series of 501 consecutive cases thus dealt with there occurred but 6 deaths, none due to peritonitis. In his hands the mortality of operations for appendicitis with localized abscess was thus reduced from 8 to 1.2 per cent.

Where an appendiceal abscess is walled off, the anterior peritoneal layer is not affected, Page (Brit. Med. Jour., Nov. 14, 1914) states that the mortality from ordinary procedures is high because of the unavoidable peritoneal soiling. This can be largely avoided by leaving the abscess intact after abdominal incision. A cigarette drain is passed gently down to the abscess, and left *in situ* for a few days until adhesions have formed along its track. Then the abscess can be broken by a finger inserted through this canal, if not already ruptured, spontaneously. In a number of cases the abscess disappeared after insertion of the drain.

Two fatal cases of *hemorrhage* from the iliolumbar artery or its tributaries, both occurring some days after drainage of an appendicular abscess, were observed by Patel and Murard (Revue de Chir., Aug., 1912). Such accidents may occur where the abscess lies in the iliac fossa or retrocecal space. In most cases a drain has proved a factor. In some cases, however,. it has been due to purulent infiltration of the vessel and thrombosis of the *vasa vasorum.* Effectual treatment is possible only where the rupture and hemorrhage take place gradually. Drains in appendicular abscess should be placed superficially, or if the abscess cavity is deep, should be removed from the neighborhood of vessels.

In *suppurative appendicitis,* after the appendix has been removed, G. C. Boughton (Amer. Jour. Surg., xx, 45, 1916) places 2 or 3 drains in position, 1 down into the abscess cavity near the stump of the appendix and 1 down into the pelvis. The wound is then partially closed, using chromicized catgut for the peritoneum. The patient is given 8 ounces (240 c.c.) of saline solution per rectum and placed in the true Fowler position, and the saline repeated in 6-ounce (180 c.c.) doses every 2 hours for 3 doses, then 4 ounces (120 c.c.) every 3 hours for the next 10 or 12 hours. The first dressing is done 48 hours after operation, and the tubes withdrawn a little to prevent pressure on or necrosis of bowel in contact with them. The pelvic drain is removed on about the fifth day. Nothing is given by mouth for 24 hours, then sips of water allowed, and gradually, albumin water, chicken broth, and buttermilk. Patients unable to expel gas are given **eserine sulphate** 1/50 grain (0.0013 Gm.) and **strychnine sulphate** 1/30 grain (0.002 Gm.) hypodermically every 4 hours, with low soapsuds enemas.

In *septic peritonitis* with continued fever, the wound appearing healthy, and careful examination showing no undrained pockets, Delatour (N. Y. Med. Jour., Feb. 13, 1915) urges that one should make a rectal examination, especially if the patient is losing ground, and has frequent bowel movements with tenesmus and drainage of mucus. If an abscess is found it should be drained through the rectum. The writer followed this plan in 7 cases with good results. While aspiration may prove satisfactory in some cases, he recommends incision whenever possible.

A. Maclaren (N. Y. Med. Jour., June 27, 1914) recommends **rectal and pelvic drainage** in appendicular residual abscesses. In general peritonitis and small abscesses (less than 4 ounces) it is a life-saving procedure, reducing the mortality by over 50 per cent. A rectal examination is urged in all abdominal cases. Six days after operation, if pus accumulates in the *cul-de-sac,* and night-pains and other signs of sepsis occur, rectal section should be done even with pus streaming out of an abdominal incision. In bad cases he advocates rectal section and a rubber tube winged drain, with later laparotomy for removal of the gangrenous appendix. In young girls he also practices rectal drainage, but in adult women prefers vaginal. The opening is made with sharp scissors —dilating, not cutting the tissue.

In tracing the late results of operation for acute appendicitis in 117 cases, G. P. Muller (N. Y. Med. Jour., Oct. 30, 1915) found that *hernia* occurred in 20 per cent. of cases which had been drained. Among those not drained, but 1 developed hernia. Nine patients suffered from adhesions, 6 drained and 3 not drained; 14 had indigestion, 8 drained; 17 had pain of obscure cause. Constipation was rather common. Postoperative comfort depended on prompt operation, avoidance of cathartics before operation, and minimum of drainage. White (Surg., Gynec., and Obstet., Nov., 1914) advises routine ligation of the deep epigastric artery in drainage cases when the incision in suppurative appendicitis approaches the vessel.

Pregnancy.—A. P. Heineck (Med. Fortnightly, May 15, 1917) does not recommend the interruption of pregnancy. During the operation the uterus should be handled as little as possible and later opiates should be administered. The operation may be performed under local or general anesthesia. The operation of choice is **appendicectomy.**

Children.—Aynesworth (Amer. Jour. of Obstet., Nov., 1915) emphasizes that laxatives are distinctly contraindicated in *appendicitis in children,* as in adults. If nausea and vomiting continue, **gastric lavage** is invaluable. A small enema to relieve the colon may be given. In reality, there is no medical treatment for appendicitis in a child unless operation is refused. **Morphine** can then be used to relieve pain. **Saline enteroclysis,** if taken kindly, is apparently valuable. No water or food should be given except in rare instances. Every child with acute appendicitis should be operated upon if seen early. If there be, however, great distention and rapid pulse, spreading tenderness and general muscle rigidity, with more or less cyanosis, rapid respiration, and all the evidences of septic absorption, to operate is to invite disaster, and many more will get well under medical measures. Between these 2 extremes are often met patients with evidences of abscess or of local peritonitis that is spreading. These should be operated upon when the general body resistance is good.

bichloride solution in, ii. 108
Deaver's incision in, ii. 106
drainage in, ii. 110
enema of hot coffee or whisky in, ii. 110
enemata in, ii. 105
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ice compresses in, ii. 105
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Symptoms, ii. 114

The gynecologist, according to R. T. Morris (Trans. Amer, Med. Assoc.; N. Y. Med. Jour., June 30, 1917), finds it difficult to differentiate between pelvic conditions and the 4 marked types of appendicitis: 2 irritative lesions and 2 infective lesions. The leading diagnostic point differentiating between any form of *chronic appendicitis* and pelvic conditions lies in the fact that the *right sympathetic lumbar ganglion only* is *hyperesthetic* on pressure; whereas in any *chronic pelvic irritation or infection, both right and left ganglia hyperesthetic.* There is no direct nerve connection between the appendix and the ganglion in question.

In one year Rutkevitch (Rousky Vratch, Mar. 21, 1915) had 76 cases of chronic appendicitis, all in women. In 60 an operation was done. The only reliable diagnostic method is by palpation. The writer could feel the appendix in 68 per cent. of cases, in 88 per cent. of which it proved painful. He recommends a new procedure for exploration by *adduction of the cecum.* The flexed fingers of the right hand are worked between the outer wall of the cecum and the abdominal wall; then by extending the fingers the physician tries to push the cecum toward the median line. In chronic appendicitis this causes pain. In all cases this sign was positive. With palpation of the ileum it helps to distinguish appendicitis from diseases of the adnexa.

Bassler (Amer. Jour. Med. Sci., Aug., 1913), to facilitate the diagnosis of chronic appendicitis, tried to *ascertain the lower, outer and inner borders of the cecum,* usually distended with gas, *by percussion;* he estimates from this the position of the appendix, and finds out whether there is tenderness at that point. Where mapping out the cecum by percussion is not possible, he places the thumb at the junction of the right edge of the rectus muscle and umbilicospinal line, and, with it pointing toward the ensiform, sinks it in about halfway to the back of the abdominal cavity; next he swings it to the right of the patient at a right angle to the line of previous pressure, thus *pinching the appendix against unyielding structures and eliciting tenderness* if it be diseased. If this test is negative, he repeats it ½ inch lower, and tests again until the brim of the pelvis has been almost reached. A control is made by pressure on the left side. Aaron (Jour. Amer. Med. Assoc., Feb. 1, 1913) asserts that in cases of chronic appendicitis with digestive symptoms, induction of *referred pain or distress in* the *epigastrium, left hypochondrium, umbilical, left inguinal, or precordial region* by a *continuous firm pressure over McBurney's point* is a valuable test in deciding when and when not to recommend operation.

In a report of 41 cases of *chronic indigestion* in which chronic appendicitis was finally diagnosed, Harold Barclay (Amer. Jour. of Surg., Aug., 1912) obtained entire, or almost entire, relief after appendectomy.

Rochard and Stern (Presse méd., Oct. 11, 1913) observed 3 cases of chronic appendicitis in which there had been at no time any acute appendicular attack or abdominal pain, but which had presented 2 misleading symptoms, viz., *pain referred to the right hip,* and intermittent *claudication* coming on *after fatigue.* All these patients limped. Tenderness at McBurney's point could be elicited. Prompt recovery followed appendectomy.

Special Signs.—In eliciting the *Bastedo sign* in chronic appendicitis, A. F. Hertz (Lancet, Mar. 23, 1913) uses a rectal flatus tube which he inserts only about 1½ inches from the anus. The patient then lies flat on his back, and on slowly pumping air in the colon gradually distends, causing finally a diffuse discomfort in the lower abdomen, or, in the presence of appendicitis, pain in the right iliac fossa, even if the pain has previously been confined to the epigastrium or umbilicus. In 1 case, in which a diseased appendix was subsequently removed, pain was only felt some hours later. Whenever pain is produced, and in some cases in which no pain has been felt, well-marked tenderness develops near McBurney's point. Frequently pain is referred to the epigastrium upon pressure in the iliac fossa after inflation. Bischoff (Monats. f. Geburtsh. u. Gynäk., Sept., 1914) tried Bastedo's diagnostic procedure in 37 laparotomy cases. In 23 the sign was present and in all these there was chronic appendicitis in one of various forms.

N. M. Volkovitch (Roussky Vratch, Apr. 26, 1914) describes a *muscle sign* associated with chronic appendicitis, a weakness and slight atrophy of the right abdominal muscles. Comparison of the 2 sides shows less resistance on the right. The more chronic the appendicitis the more pronounced the sign. It is not observed in any other pathological state. In young people there is in addition a left-sided scoliosis, produced by constant leaning toward the affected side.

Diagnosis, ii. 115.—While *Lane's iliac band* may cause symptoms almost indistinguishable from those of chronic appendicitis, John Morley (Lancet, Jan. 9, 1915) states that its frequency and especially that of the symptoms from it have been greatly exaggerated. Jackson's pericolic membrane may also cause these symptoms because of the associated abnormal mobility of the intestine which may lead to torsion and stasis. Mobile proximal colon may alone give rise to similar symptoms, as may also inflammatory bands and adhesions. The commonest condition simulating chronic appendicitis, however, is right-sided chronic tubal and ovarian disease. In many of these cases an etiological diagnosis is practically impossible. G. Reese Satterlee (Amer. Therap. Soc.; Med. Rec., Sept. 23, 1916) points out that a careful study of all cases diagnosed as chronic appendicitis is necessary, including use of the X-ray. The symptoms of chronic appendicitis and *cecal disease* are often very similar. Proper treatment for chronic intestinal toxemia clear up symptoms resembling chronic appendicitis. Autogenous colon vaccines should be tried in every case. The internist should be always on the guard for appendicitis in every case of chronic intestinal toxemia. F. Gregory Connell (Jour. Amer. Med. Assoc., July 29, 1916) found that many among a large series of cases operated on for chronic appendicitis, or as interval cases, were not relieved of their symptoms. These cases might better be classed as *pseudoappendicitis,* and occurred usually in persons with *visceral ptosis, constipation,* and *neurasthenia.* This condition does not call for surgical treatment. The typical features are more or less continuous pain in the right side of the abdomen—mild and short attacks, with short intervals of freedom. The pain is made worse by exercise and relieved by recumbency. There are cutaneous hypersensitiveness, muscular spasm, gas tumor, cecum mobile, gurgling, nausea, normal or subnormal temperature and no leucocytosis. Vomiting is rare. These patients often become chronic invalids. Mathieu (Gaz. des Hôp., June 4, 1914) states that appendicitis and chronic colitis may occur as a complication of *gastric ulcer.* The former is frequent, the patient giving a history of previous attacks of appendicitis. In some instances the symptoms of the latter predominate, and the ulcer fails to respond to treatment until appendectomy is performed. Occasionally even this operation fails to procure relief, but this occurs under treatment for the ulcer. At times the appendiceal symptoms are due to displacement of the pylorus to the region of the appendix. This is revealed by an X-ray examination.

Rona (Arch. f. klin. Chir., xcvii, Nu. 4, 1912) reports a case in which an unsuspected chronic appendicitis induced symptoms during menstruation which were ascribed to ordinary *dysmenorrhea.* After appendectomy the dysmenorrhea ceased. In 1 case 6 days were lost before an appendectomy was considered, but the patient was then moribund.

X-ray and Fluoroscopic Examination.—According to M. J. Hubeny (Ills. Med. Jour., xxix, 109, 1916) X-ray examination obviates some errors in the diagnosis of chronic appendicitis. *Fluoroscopic examination* is the most satisfactory, visualization of the appendix being secured preferably with *an opaque meal.* If the appendical lumen be not patent, the appendix may of course not be demonstrable. A. W. George and I. Gerber (Boston Med. and Surg. Jour., Oct. 9, 1913) state that the kinked and adherent appendix is shown by the *X-rays.* In cases of Lane kink one can demonstrate the fixed and distended terminal loop of ileum. In cases of Jackson's membrane one can show the effect of the adhesions under the *fluoroscope,* as well as the presence of a characteristic mechanism of filling. Various adhesions in this region from old inflammatory disease or congenital anomaly can be similarly shown. Cecum mobile and left-sided appendicitis can readily be demonstrated.

H. M. Imboden (Amer. Jour. Röntgenol., ii. 581, 1915) points out that peritoneal adhesions, obliteration, or strictures of the appendix can sometimes be inferred in *X-ray examination* from the following manifestations: drainage, position and direction, kinks and obliterations, size, length and caliber, mobility, and points of tenderness. The presence of some of the opaque meal in the appendix is no indication of chronic disease. Delay in emptying beyond 24 hours after the cecum is empty or after vigorous catharsis, or if associated with distinct tenderness, is, however, suspicious.

Pathology, ii. 90, 116.—In an analysis of 100 cases of obliterative chronic appendicitis operated upon by Deaver, D. B. Pfeiffer (Annals of Surg., Apr., 1915) found that appendicular sclerosis and its terminal stage, appendicular obliteration, differ pathologically and clinically from chronic active appendicitis. In the latter there is either a persistent low-grade infection, or recurring attacks separated by intervals of latency. In the former, no active or latent inflammatory process is present, but merely the end-results of such a process. With appendicular obliteration there are 3 types of symptoms: (1) *reflex,* due to irritation of the nervous mechanism of the appendix, the "dyspeptic" type of appendix; (2) *local,* due to mesenteric and peritoneal contraction, and inflammatory bands or adhesions affecting the appendix, cecum, ileum, or ascending colon; (3) *consecutive* symptoms, general and local, consequent upon disturbed function of the ileocecal region. Simple appendectomy avails for reflex symptoms, but in local and consecutive symptoms only insofar as the operation permanently frees symptom-producing contractions, sclerosis, or adhesions.

appendectomy in, ii. 116

Post-operative Prognosis.—Krecke (Münch. med. Woch., Mar. 18, 1913) among 70 cases of chronic appendicitis later traced, found that 70 per cent. of the patients had been cured by the operation, while relief had been given in 30 per cent. In the latter the appendix was diseased only as part of a more general disease of the large intestine. The symptoms were pains in the right iliac fossa, radiating to other parts, with disturbances in defecation, tenderness in the right iliac fossa, resistance, and roentgenoscopic delay in the digestion in the cecum. The pains constituted rather a sense of oppression or discomfort than the boring or stabbing pain of appendicitis. With colitis the pains spread over the entire abdomen and are more constant. Exacerbation from physical effort or menstruation rather suggests general bowel trouble, while constant tenderness at McBurney's point speaks for chronic appendicitis. In the latter, however, especially the recurrent form, there is frequently no tender point anywhere. Resistance in the ileosacral region suggests participation of the colon, as do also constipation, intestinal fermentation and mucus in the stools. Colitis can be either the consequence or cause of chronic appendicitis. If improvement occurs under physical and dietetic measures, appendicitis can generally be excluded. A tendency to nervous disturbances also speaks against localized appendicitis.

belladonna in, ii. 117
bismuth in, ii. 116

In the appendicitis occurring in conjunction with gastric ulcer Mathieu (Gaz. des Hôp., June 4, 1914) obtained the best results with **bismuth subcarbonate** 5 drams (20 Gm.) and magnesium oxide 75 grains (5 Gm.) daily, the first being increased if pain is the more prominent symptom, while the magnesia is increased if constipation is the more troublesome. This treatment is also indicated when chronic colitis complicates the case.

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Appendicostomy, i. 82

In gastro-intestinal perforation followed by acute peritonitis, J. Roux (Rev. méd. de la Suisse Rom., xxxv, 814, 1915) noted that the nausea, vomiting, and cardiac and pulmonary symptoms due to paralysis of the intestine, cease after appendicostomy, normal peristalsis being, moreover, re-established. The fluid introduced through the appendix by the drop method is quickly absorbed and nothing need be given by mouth until normal conditions are restored in the intestine. After 12 hours, the fluid discharged by rectum is usually colored with bile, showing intestinal paresis has been overcome. Appendicostomy does not prolong the major operation more than 2 or 3 minutes. The absorption of water prevents shock and causes rapid detoxication by washing out the large intestine; siphonage of the small bowel is also affected. The writer reports 10 cases, in 1 of which the bowel had been perforated in 8 places by a bullet. Two patients had been run over. Most of the other cases were perforated gastric ulcers. The appendicostomy gave results not obtainable by any other procedure.

Relief of pain and general improvement in a case of *mercuric chloride poisoning* was obtained by G. Patry (Correspondenz-Blatt f. schweizer Aerzte, July 17, 1915) by washing out the colon through an appendicostomy opening every 2 hours. In a robust man of 60 with rebellious *ulcerative colitis* the appendix and cecum were sutured to the skin and the colon systematically rinsed by the patient himself with salt solution introduced with enough force to emerge from the anus at once. The patient regained 60 pounds and was in complete health 15 months after the operation to close the fistula.

In *intestinal stasis,* irrigation by rectum is against the waves of peristalsis and is thus antiphysiologic In a young woman with serious chronic constipation, only temporarily improved by partial resection of the colon and colopexy, the transverse colon having swung down into the small pelvis, the appendix was fastened to the skin and decapitated and a catheter passed into the cecum. At first 200 Gm. (6½ ounces) of olive oil, and later saline solution, were injected in increasing amounts. When a daily passage was obtained the amounts were reduced and the intervals lengthened to 2 a week, this being continued for 4 months. The bowel function remained normal 2 years later. In peritonitis the writer has noted the rapid resumption of bowel function after appendicostomy, even upon merely injecting water under pressure and letting it run out again.

saline solution in, i. 83
Appendicular abscesses, ii. 111, 371
Appendix, cancer of,

L. B. Meyer (Surg., Gynec., and Obstet., Sept., 1915) reports 3 cases of primary carcinoma of the appendix among 707 consecutive appendectomies and reviews 266 cases in literature. In only 10 per cent. of cases can the pathologist even suspect the condition by macroscopic examination.

MacCarthy and McGrath (Surg., Gynec., and Obstet., Mar., 1911) of the Mayo Clinic, examining 8089 appendices, found 40 of them carcinomatous. The lesion was usually at or near the tip and often associated with an obliterative type of appendicitis. There had been no gross evidence of the condition at the operation. Seventy-three per cent. occurred in females, with an average age of 30 years.

Referring to Letulle's first description, in 1897, of *carcinoid* tumors of the appendix, Tuxen (Hospitalstidende, Apr. 18, 1917) states that about 250 cases have since been published. Such tumors are benign. They usually appear between 20 and 30, though rarely in childhood and old age. Out of 8 cases of appendiceal cancer observed by the writer, only 3 were typical carcinoids. The appendix was removed in each case for acute or chronic appendicitis.

M. G. Wohl (Annals of Surg., lxiv, 311, 1916) observed a case of sarcoma of the appendix. This growth is rare, there being but 10 authentic cases. The treatment of sarcoma has usually been simple **appendectomy,** but the prognosis is less favorable than in carcinoma of the appendix.

cysts of,

Matas (Jour. Am. Med. Assoc., Jan. 24, 1914) reports a case of retroperitoneal, multilocular, *retrocecal cyst* of the appendix weighing 1582 Gm. (over 52.7 ounces) containing a gelatinous, coagulable, myxoid fluid. It measured 47.5 cm. in circumference. The appendix was quite distinct and separate, though attached to the mass. It is believed to have been an outgrowth of some embryologic relic connected with the mesentery. The patient, a young man, aged 25 years, recovered uneventfully. G. E. Dodge (Annals of Surg., lxiii, 334, 1916) discusses 142 cases of *cystic dilatation of the appendix.* The condition seems relatively rare. True hydrops makes up less than 9 per cent. of these cysts, which are essentially retention cysts of inflammatory origin. The appendiceal lumen, while often obliterated, may be patent. Symptoms are produced in 24 per cent. of all cases, and at least 51 per cent. of operative cases. The contents of some of these cysts implanted on the peritoneum are capable of producing the condition known as *pseudomyxoma peritonei.* Some of the cysts seem allied to adenocystomata. Carcinomatous changes are occasionally observed, although some of these have lacked the clinical aspects of malignancy.

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Arsenic, ii. 119

Physiological Action, ii. 121.—Starting with 1/60 grain (0.001 Gm.) doses of arsenious oxide thrice daily immediately after food, Harding (Lancet, Jan. 24, 1914) gradually reached the dose of 1⅕ grains (0.078 Gm.), which produced irritability and distinct and lasting discomfort every way it was taken and all precautions notwithstanding. In 1 grain (0.065 Gm.) doses the drug could only be taken with comfort if dry foodstuffs were consumed at meals; if liquid beverages or soft foods were partaken of, the administration of the grain (0.065 Gm.) dose of As_2O_3 produced immediate discomfort and burning pains in the abdomen, lasting 40 minutes to 1 hour followed by diarrhea.

The relations of arsenicals to the *ductless glands* have received attention. Brown and Pearce (Jour. of Exper. Med., Nov. 1, 1915) tested the action of arsenical compounds on the *adrenals* on male guinea-pigs and also on rabbits and dogs by intravenous administration.

The compounds tested comprised arsenious and arsenic acids, sodium cacodylate, atoxyl, arsacetin, arsenophenylglycin, salvarsan, and neosalvarsan. Sterile solutions of the substances were injected intraperitoneally in black and in white animals respectively. The writers conclude as follows: (1) Toxic doses of all arsenicals produce definite pathological changes in the adrenals of guinea-pigs. These include congestion, hemorrhage, disturbances in the lipoid content, cellular degenerations and necroses, and reduction in the *chromaffin content.* (2) The character and severity of the injury produced by different arsenicals varies with the chemical constitution of the compounds. (3) From these facts they believe that adrenal injury is an important factor in arsenical intoxication.

Hall (Jour. Amer. Med. Assoc., Apr. 24, 1915) in experiments with sodium cacodylate, sodium arsenate, neosalvarsan and salvarsan, introduced intramuscularly, or into the veins, the *spinal fluid* being examined at varying intervals afterward for the drug, obtained negative results, excepting in 4 cases of neosalvarsan intraspinal injections. Salvarsan introduced intravenously gave like results, except in 2 cases.

The view that arsenic is retained during *pregnancy* was confirmed by Frommer (Arch. f. Gynäk., ciii, No. 2, 1914) in rabbits, human fetuses and the organs from pregnant cadavers, including two cases of eclampsia, and in some male cadavers. The organs of one young man who had succumbed to Banti's disease showed quite a large proportion of arsenic. It was positively known that he had taken no arsenic during eight months at least before his death. In all organs examined arsenic was found in amounts ranging from traces to considerable proportions. M. Ries and J. Ries (Münch. med. Woch., May 14, 1912) studied the ability of the *uterine glands* to store arsenic as a cause of menstruation. Armand Gautier had demonstrated that the thyroidal arsenic was discharged in the menstrual blood, where he found 0.28 milligramme to the kilo, the normal blood containing no arsenic. Hertoghe, who also showed that the premenstrual secretion sometimes discharged more arsenic than the menstrual blood, while the secretion after the menses never contained arsenic. The authors found that the arsenic discharged in the menstrual blood, does not come from the thyroid, but from uterine glands, which act specifically as repositories for arsenic, similarly to the thyroid.

Pearce and Brown (Jour. Amer. Med. Assoc., Sept. 25, 1915) have found experimentally that the *kidneys* of animals given lethal doses of arsenous acid, salvarsan, neosalvarsan, galyl, arsenophenylglycin, atoxyl, and arsacetin were separable into two extreme groups, the red and the pale kidneys, with transitional types in which the predominating changes ally them more closely with the one group or the other. In the group of red kidneys, congestion and hemorrhage are the dominant features of the arsenic action, while in the pale kidneys, the dominant lesion is tubular.

Untoward Effects. The prevailing hobby, *anaphylaxis,* is also being credited with the abnormal effects of arsenicals in general. In a case of supersensitiveness to arsenic, Kaufman (Deut. med. Woch., Feb. 6, 1913), after from 2 to 4 injections of *cacodyl* had caused no reaction whatever, observed after every subsequent injection a large and firm local infiltration about the size of a silver dollar, which felt warm and itched violently, though not painful. It underwent involution with desquamation in the course of a few days. The phenomenon suggested in every way not simple irritation but anaphylaxis. Schlecht (Münch. med. Woch., Apr. 15, 1913) refers to 2 cases of oversensitiveness to organic arsenic preparations (*arsenophenylglycin* and *salvarsan*) in which there appeared an extensive exanthem and a local and general eosinophilia. The eosinophilia was due either to a local injury to the cell or proteid by the eosin, causing a local production of eosinophilia, or the entrance of a toxin into the skin with secondary production of eosinophils. C. Staeubli (Deut. med. Woch., Dec. 26, 1912) in 2 patients treated with *sodium cacodylate* observed acute symptoms following injections. The hypersusceptibility to the drug resulted in extensive local inflammatory swelling, marked rise in temperature, general malaise, headache, diffuse pains in the joints, loss of appetite, and, in one case, dyspnea.

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D. Sieber (Arch. Internat. de Pharm. et de Therap., vol. xxii, Nos. 3 and 4, 1913) was able to save animals to which a lethal dose of Fowler's solution had been given by mouth or subcutaneously, by injecting full doses of **magnesium sulphate** hypodermically. Animals poisoned intravenously, however, could not thus be saved. The magnesium acts, therefore, only before the arsenic has entered the blood and combined with the tissue cells. Its effect is probably produced through retardation of the absorption of the arsenic owing to the formation of magnesium arsenic compounds that are only slightly soluble.

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R. Pye-Smith and the discussion that followed at the Clinical Section of the Royal Society of Medicine (Lancet, July 19, 1913) emphasizes a risk insufficiently appreciated in practice, namely, the possibility that serious mischief may follow the prolonged use of arsenic in the treatment of chronic affections of the skin. Psoriasis is the disease for which such a use of the remedy is most often made, and it is in those who have suffered from this malady that *epitheliomatous developments* have most frequently been recorded. The first observer to direct attention to the sequence was the late Sir Jonathan Hutchinson, and some 30 cases are now on record. The writer describes a case of his own in a woman. In spite of operative removal, death occurred, apparently from internal metastatic growths, about 2 years after the woman first came under medical treatment.

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Arteriosclerosis, ii. 147

Diagnosis, ii. 166.—*Bulging in the subclavian arteries,* where they turn to a right angle to the axis of the aorta, when the walls of the latter have lost their elasticity, is regarded by Trunecek (Münch. med. Woch., Feb. 10, 1914) as a sign of sclerosis of the aorta. As the aorta cannot stretch, the blood entering it at each pulse wave races with its usual violence into the artery beyond and hits against the upper wall of the subclavian artery at this point. The bulging where it hits this wall can be easily felt with the finger with each pulse wave.

In the opinion of L. F. Bishop (Med. Rec., Oct. 9, 1915) arteriosclerosis is without symptoms during the first 5 years, and often even without objective signs. *Pain in the cardiac region,* usually on exertion, is one of the earliest symptoms. It occurs sometimes also after meals, giving rise often to an erroneous diagnosis of gastric fermentation. Arteriosclerotics are *sensitive to meat proteins* while *some* are *also* sensitive *to fish and egg proteins.* The flesh of fowl is frequently tolerated. Hirsch

(Med. Klinik, July 13, 1913), however, opposes the generally erroneous belief that arteriosclerosis occurs only at an advanced age. Among the spastic disorders of childhood a *spastic state of the blood-vessels* in them is also observed in some, which suggests the presence of incipient arteriosclerosis.

Early symptoms of arteriosclerosis are, according to A. Graham-Stewart (Pract., Apr., 1915), a *slight shortness of breath* on a slight exertion; headache, or a *sense of* pressure or *fullness in the head; slight giddiness* on assuming the erect posture quickly; *dilatation of the venules in the malar region.* A feeling of *tightness across the chest* may be an early sign, but more often it is late. *Cerebral symptoms* also may appear early, but are generally late. Another early sign, which may be almost the only one, is an *irritating cough,* that calls attention to the vascular system, or a sort of *sigh,* due to a feeling as though there was not room enough in the chest. *Digestive troubles* are common, as well as the frequent passage of large quantities of *limpid urine of low specific gravity.* H. F. Stoll (Jour. Amer. Med. Assoc., Sept. 16, 1916) also emphasizes the significance of *nocturnal polyuria and a persistently low gravity,* and the importance of not giving nitroglycerin tablets the moment there is hypertension, since the patient may require a high pressure to get the blood through his small inelastic vessels. Hofbauer (Med. Klinik, July 13, 1913) is convinced that many cases diagnosed as *neurasthenia* are in reality cases of arteriosclerosis in adults under 30.

The eye is the organ where arteriosclerosis is often manifested earliest, and where it can most accurately be appreciated by study of the background, according to Elsworth Smith (Interstate Med. Jour., Jan., 1914). Retinitis, especially the *degenerative form of albuminuric retinitis,* rather than the inflammatory variety indicates arteriosclerosis. The latter is apparently not mentioned among the etiological factors of *choroiditis,* but it is reasonable to assume that it might be responsible for this, as well as for retinitis. In arteriosclerosis, *hemorrhages into the vitreous humor* follow rupture of vessels of the retina and choroid. Arteriosclerosis may also prove active in the pathogenesis of *glaucoma.* Wiener and Woldner (Jour. Amer. Med. Assoc., July 17, 1915) have observed in *patients in whom the blood-pressure is high* that *the pupil* is *larger than the average normal pupil,* with a usual minimum of 4.5 mm. in width. While it contracts promptly to light stimulus, it immediately returns to the original size and there remains, without the light stimulus having been changed. The association of this symptom with the high blood-pressure of arteriosclerosis is so nearly constant as to make it at least strongly suggestive.

R. F. Moore (Quarterly Jour. of Med., Oct., 1916, Jan., 1917) found that out of 44 cases in which a gross cerebral vascular lesion had existed, 31 exhibited evidence of retinal vascular disease, while in 19 of these they were severe. In 26 cases of 27 that died, a gross vascular cerebral lesion proved to be the cause of death in 12.

After a study of the psychoses associated with cerebral arteriosclerosis, Nack (Med. Rec., Dec. 11, 1915) concludes that there are 3 periods of development: (1) the *involuntary,* where degeneration is caused by the ordinary wear and tear of life; (2) the *toxic,* in which degeneration is caused by poisons of acute and chronic infections and intoxications; (3) that in which degeneration follows *persistent high blood-pressure.*

C. L. Greene (Amer. Therap. Soc.; Med. Rec., Sept. 23, 1916) holds that in the interest of the cardiopath a justifiable optimism should replace the almost universal pessimism now existing. Cardiac inefficiency should be given their full value as means of early diagnosis and indicators for therapeutic initiative. The great usefulness of *test doses of digitalis* with or without reinforcement by physical rest constitute the very foundation of timely diagnosis.

Prognosis.—The prognosis of arteriosclerotic heart disease is summarized by G. Klemperer (Therap. der Gegenwart, July, 1914) as follows:—

The *early stage,* with pains over the heart, usually of medium intensity and often neurotic symptoms. There is generally accentuation of the second aortic sound with frequently a systolic murmur at the base without enlargement of the heart. Slight irregularity of the pulse is not rare. The accentuation of the second sound may be due to presclerotic neurasthenia and may thus be a purely nervous symptom, though it generally persists in elderly individuals. The prognosis here under proper treatment is favorable.

In the *second stage* there is dilatation of the heart and often a diastolic murmur and dilatation of the ascending aorta. Irregularities of the pulse are frequent, but true angina pectoris does not occur. The prognosis is still relatively favorable.

The *third* and *last stage* is characterized by insufficiency of the heart, with cardiac asthma and edema and attacks of angina pectoris. The prognosis here is grave, particularly if the latter attacks are accompanied by intense pain and feeling of dissolution, small pulse and cool extremities. Rare cases are on record where the patients lived 5 to 9 years after their attacks.

George Dock (Trans. So. Med. Assoc.; N. Y. Med. Jour., Apr. 7, 1917) holds that a bad prognosis should not be given at the first examination unless the evidences of heart failure were well marked, or unless there was advanced arteriosclerosis, strong suspicion of coronary artery disease, or evidence of severe renal insufficiency or other dangerous organic disease. Even then, the bad prognosis should be tempered by a statement as to the chance that rest and appropriate treatment might modify the outlook.

Etiology and Pathogenesis, ii. 169.—Anaphylaxis due to food proteins and the ductless glands has received considerable attention in this connection. L. F. Bishop (N. Y. Med. Jour., Sept. 13, 1913) holds that arteriosclerosis is not the effect of proteins on the individual but the reaction of the individual to the proteins. The vegetable proteins apparently cause the least harm. The disease is liable to begin when, through some accident of food poisoning, severe illness, nervous shock, or some unknown incident, the cells of the body become sensitive to particular proteins found in customary food. Later there is a continuous subsymptomal anaphylaxis, leading to irritation and finally to changes in the tissues—perhaps to replacement of some of the cells by connective tissue. This takes place in all parts of the body. The impairment of the organs leads to failure of the internal secretions and of general metabolism, and the individual, who started with a sensitiveness to a single protein is found, after perhaps 25 years, to present the picture of the terminal stages of so-called Bright's disease.

In a study of the arterial lesions produced by feeding egg yolk and cholesterol or cholesterin fat to rabbits, Bailey (Jour. Exper. Med., xxiii, p. 69, 1916) confirms the findings reported by others. After a period varying from 30 to 348 days, 11 of the 15 animals showed in both the aorta and pulmonary artery small raised yellowish white spots and streaks close under the inner lining. The spots contained large cells with fat containing droplets which were anisotrophic, associated with proliferation of fibroblasts and fine elastic fibers. Fatty degeneration appeared in the media occasionally. The adrenal was not infrequently found much enlarged. It is probable that the adrenal has some function in the storage and metabolism of the cholesterol.

The poisonous effects of either intestinal stasis or of the ingestion of food stuffs toxic for a certain individual are emphasized by Willson (Jour. Amer. Med. Assoc., Sept. 25, 1915). These are ascribed to pronounced incapacity from the ineffectual emptying of the rectum or sigmoid. Higher up in the colon or in the small intestine particles of food undergo decomposition which fill not only the intestine but also the blood and lymph circulation with poisonous gases. These may be retained in the bowel for hours, especially at night, slowly filtering into the blood.

The intermediary through which toxics caused the arterial changes was sought by Sajous (Monthly Cyclo. and Med. Bull., Apr., 1913), who, basing his opinion on experimental and clinical observation, pointed out that the interposition of the adrenals and the contractile action of their secretion upon the arterioles in the problem explained at least one phase of the process. The pathogenic toxic, of whatever kind, causes a more or less violent overactivity of the adrenals (probably by exciting their center) and thus increases sufficiently their secretory activity to reduce more or less the caliber of the arterioles from which the vasa vasorum receive their supply. Deficiently nourished through these, their nutrient vessels, the medial and intimal vascular tissues degenerate, forming the familiar sclerotic patches. He held, moreover, that *autolysis, through the presence of an excess of antibodies in the blood,* could engender arteriosclerosis in certain febrile infections, typhoid fever and acute rheumatism, for example.

[In a later paper (Amer. Congress of Intern. Med.; N. Y. Med. Jour., May 26, 1917) I divided the disease into three types:—

1. The *adrenal type,* due to overactivity of the adrenals (and, through their hormone, of the thyroid gland also) observed in persons subjected to hard physical exertion, blacksmiths, letter carriers, hod-carriers, bicyclists, etc., with high blood-pressure, exuberance, pains in the calves of the legs, slow full pulse, hard systolic cardiac impulse, "palpitations," muscular pains, hyperchlorhydria, pyrosis, as more or less clearly defined symptomatology in which the vascular walls are thickened, hyperemic, but not necessarily the seat of degenerative lesions, unless excessive constriction of the vasa vasorum have so reduced the nutrition of certain areas as to cause them.

2. The *autolytic type,* where slowly acting poisons, food proteins, overfeeding, alcohol, the excessive use of coffee, etc., with exaggerated metabolism and focal autolysis in the vascular walls due to the presence *in the blood of an excess of antibodies* evoked therein by the poisons, or by some acute febrile (bacterial) disease. In the overfed we may witness as early symptoms those enumerated above, with flushed face, brilliant eyes, slight precordial pain after a copious meal or exertion, sometimes slight, and general vivacity. This stage in reality corresponds with the active period of an infection which, though relatively short, may do considerable damage to the blood-vessels. The patient then passes into what is erroneously described in some text-books as an early manifestation of first stage, but which in reality is a more or less advanced phase of the disease, in which the contractile power of certain areas of the arterial system are already compromised. When this stage is reached the syndrome recalling neurasthenia develops more or less clearly, *i.e.,* those of a debilitated and unevenly distributed circulation: loss of vigor, lassitude or myasthenia, drowsiness, postural vertigo, faintness, more or less visual disturbances —hemianopsia or even amaurosis— phobias, headache and dyspnea on exertion.

3. The *denutrition type,* in which in addition to the arterial lesions there is exhaustion of the adrenals and thyroid through the excessive functional activity imposed upon them by the

pathogenic toxic, whatever that may be, the patient having then reached what has been termed the "presenile stage" of arteriosclerosis. In some subjects this may develop early, even in those of frugal habit, because their ductless glands, including the thymus, through inherited debility, are unable to bear the least exacerbation of activity, physical, mental and also emotional. In others, again, the ductless glands may have become debilitated through local hemorrhages with resulting functionless areas, as a result of febrile infections of childhood, diphtheria especially. Such cases of denutrition arteriosclerosis are often the prey of tuberculosis and pneumonia. They grow old early because as the wear and tear of life impinges upon their ductless glands, denutrition progresses, including that of the arterial system. C. E. DE M. S.]

Leonard Williams (Lancet, Mar. 21, 1914) comments on the varying susceptibility to this disease in different individuals. A probable explanation for this lies, he holds, in the activity of the ductless glands in destroying toxins and regulating metabolism. If the equilibrium of the glands is good, the metabolism is good, the powers of resistance are good and toxins are brought to naught. Four of the ductless glands, the ovary, the adrenal, the thymus and the thyroid, are very actively engaged in the metabolism of calcium.

The *bacteriology* of arteriosclerosis has also received attention. In a series of investigations on the nature and cause of the arterial degeneration F. W. Andrewes (Ann. Rep. of Local Government Board, Appendix B, p. 151, 1913-14) ascertained that out of 6 cases of streptococcus septicemia the organism was isolated 4 times from the aortic wall, the staphylococcus twice out of 3 cases of septicemia. In 7 cases of malignant endocarditis, however, the organism was not found in the arterial tissues. Similar negative findings were obtained in pneumonia. On the other hand, a positive result was once obtained out of 5 cases of acute rheumatic fever. Associated with *B. coli* infection the aorta was invaded by this organism in 4 out of 5 cases. Manouelian (Jour. Amer. Med. Assoc.; Annales de l'Inst. Pasteur, Jan., 1913) found that the aorta showed lesions of arteriosclerosis after repeated injections of filtrates or emulsions of cultures of staphylococci in rabbits and monkeys.

Hirsch and Loeb (Deut. med. Woch., Sept. 18, 1913) conducted experiments which suggested that *lactic acid* took part in the genesis of arteriosclerosis. This is important because during severe muscular work the proportion of lactic acid in the blood may increase from the normal 15 or 30 mg. to 150 mg. in 100 Gm. of blood, and may explain the predisposition to disease of persons doing unaccustomed heavy work.

Pathology, ii. 174.—So-called calcified arteries are not of a stony rigidity during life, according to A. H. MacCordick (Brit. Med. Jour., Oct. 18, 1913), the calcareous matter in the arterial wall being soft—a state that may be compared with unset mortar.

In arteries provided with an adequate circulation the calcareous matter, whether it be in the intima or the media, remains unset. This tends to explain why, after handling pipe-stem radials, there is no thrombosis and gangrene, and also why rigid and tortuous splenic and other mesenteric arteries in the aged arteriosclerotic do not undergo traumatic rupture.

Though rare, according to J. A. Hedlund (Hygiea, lxxvii, No. 9, 1915) arteriosclerosis of the abdominal vessels may induce symptoms suggesting angina pectoris, gastric trouble or attacks of meteorism.

In the opinion of B. A. Shepard (Mich. State Med. Soc.; Jour. Amer. Med. Assoc., Sept. 9, 1916), the toxic agents, either chemical or bacterial, may come either through the blood stream in the lumen of the artery or through the vasa vasorum, the latter being the principal medium, especially for bacterial factors. Thus, most bacteriologic degenerative changes originate as a mesarteritis rather than as an endarteritis. Syphilis is the most frequent of any of the factors which are definitely known to be in themselves solely responsible for arterial degeneration.

A number of observers, according to Strauch (Ziegler's Beiträge, lxi, p. 532, 1916), have noted the spontaneous development of canine arteriosclerosis. Koellisch found vascular sclerosis in 10 out of 50 working dogs and 13 out of 50 pet dogs. This would suggest that the hard work imposed upon dogs on the continent has no influence in bringing about sclerosis of the arteries.

Treatment, ii. 182.—I. L. Nascher (Amer. Med., Aug., 1913) concludes that of the various methods of treatment which have been advocated in arteriosclerosis, each is of service only in certain forms of it—that there is no one remedy, or no one method, applicable to all forms of the disease. The senile form cannot be cured at all.

Von Noorden (Post-Graduate, May, 1913) recommends the following method: 1. **Rest** for the whole body, and particularly for any organs specially involved in sclerotic process. 2. **Diet** such as will avoid all digestive disturbances. 3. Judicious **restriction of fluids.** 4. Systematic hydrotherapy, **carbon dioxide baths** or **electric baths.** 5. **Iodides** only where angina pectoris, syphilis, or eye affections due to sclerosis of retinal artery. 6. **Diuretin**, especially valuable in angina pectoris and tobacco heart; lowers blood-pressure markedly after some weeks' administration.

[Referring the reader to my foregoing remarks, the treatment of the 3 types of arteriosclerosis may be described is as follows:—

Adrenal Type.—Such cases yield readily to measures calculated to reduce the functional activity of the adrenals. A less arduous occupation, abstention from meat, coffee, tea and alcohol (to lower the vascular tension) often suffice. If the vascular tension is high, the condition of the kidneys should be looked into. As a rule, at this time these organs are found normal, though some polyuria be present. **Spirit of nitrous ether** may then be used in small doses thrice daily to reduce the high tension if it fails to recede after a few days, and also small doses of **sodium bromide** and **chloral** on retiring if the tendency to insomnia persists.

The iodides at this stage are harmful. So are strychnine, digitalis and tonics in general, most of which stimulate the adrenals and aggravate the trouble.

Proteolytic Type.—Prophylactic measures, a **reduction of proteins**—eliminating meats and eggs—and other harmful food the patient may be indulging in too freely, are necessary. Acidosis is another harmful factor which a **vegetable diet**, by supplying alkaline salts, tends to counteract and gradually to eliminate. Although the arteries are already damaged, there occurs an active process of repair by insular sclerosis so disposed longitudinally as to preserve the contractile activity of the vessel to a remarkable degree.

It is of course irrational to give the iodides in cases in which the thyroid secretion laden with iodine in organic combination is taking part in the cellular destruction of the arterial walls. No remedies should be administered until the toxic factor, whatever that may be, dietetic, intestinal, bacterial, etc., is eliminated prophylactically. If, after a couple of months, the patient does not show the sense of well-being which usually follows well-addressed prophylactic measures, and still complains of neurasthenia-like symptoms, it is because catabolism and arterial degeneration are still proceeding, owing mainly to hyperplasia of the thyroid. Arsenic in small doses, say 3 minims (0.18 c.c.) of **Fowler's solution**, *t. i. d.*, as shown by Mabille and confirmed by Ewald, Heinrich Stern and others, will then gradually reduce the thyroid erethism. In cases showing actual hyperthyroidia, or larval Graves's disease, **ergotin**, or the coal tars, are helpful to contract the vascular supply of both the thyroid and adrenals and thus inhibit the secretory activity. It should be remembered that **rest** is an important feature wherever exuberant activity of the ductless glands is in order.

Denutrition Type.—The treatment here is precisely the opposite of that indicated in the foregoing forms. Organotherapy, provided **thyroid** and **adrenal gland** and any other organic product used be given *in small doses*, is of very great value. The **iodides**, also in small doses, **digitalis** and **strophanthus** are all exceedingly helpful. A **sustaining diet** here is not indicated. Besides the thyroid and adrenal preparations already mentioned, some pancreatic product such as **holadin** should be added to facilitate intestinal digestion, sustain tissue life and contribute, with the other organic products administered, to the defensive resources of the organism. C. E. de M. S.]

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J. H. Honan (Med. Rec., Feb. 5, 1916) asserts that in the **carbonic acid brine baths** the salts in solution exert more action than the gas bubbles. These baths are best given at 32° to 34° C. and the cold bath is reserved for cases with subnormal intravascular pressure with a flaccid arterial wall. Slowing of the pulse is constant and important and is due to a lengthened diastole, thus resting the heart muscle. Baup (Paris méd., May 18, 1912) praises the results of treatment of arteriosclerosis at **Evian-les-bains**, owing to the skilled supervision now exercised over patients at that resort.

C. W. Watson (Jour.-Lancet, Mar. 15, 1914) advises that sufficient water or other liquid should be used to relieve thirst, but no more. Large amounts of fluid should not be taken, as the blood-pressure is thereby increased. The **warm, full bath** dilates the capillaries and lowers the blood-pressure; five minutes is a sufficient time. Cold bathing is injurious; swimming is not allowed because the cold water contracts the superficial capillaries, which when combined with the violent exercise may raise the blood-pressure dangerously high. It is not improbable that many of the cases of drowning ascribed to "cramps" are really due to cerebral hemorrhage, angina pectoris, or some other cardiovascular lesion induced by the greatly increased blood-pressure while swimming.

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L. F. Bishop (N. Y. Med. Jour., Dec. 25, 1915) forbids the saline purgatives in arteriosclerosis. **Castor oil**, he maintains, is the best, in fact the only safe and satisfactory laxative.

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chloral in, ii. 188
chloral hydrate in, iii. 210

The warning against the use of **chloral hydrate** in cardiovascular disorders given in numerous textbooks is unwarranted, according to A. Martinet (Presse méd., June 5, 1916), and has done harm in preventing the employment for hypotensor purposes of a drug both more efficacious and less injurious than the nitrites. Chloral is, with **bromides**, one of the best relievers of general and circulatory spasm. The sleep induced by chloral hydrate is characteristically followed on awakening by an abundant diuresis, as much as a liter of urine being passed in 6 or 8 hours, with manifest euphoria, relaxation from nervous tension, and lessened difficulty of breathing. A small dose of chloral suffices in some instances to overcome the inhibiting angiospasm and produce diuresis. **Chloral and caffeine** make sometimes the combination of choice for diuretic purposes.

diet in, ii. 182, 183, 185, 186

T. Williams (Trans. Amer. Med. Assoc.; N. Y. Med. Jour., June 8, 1912) recommends **Chittenden's diet** of 50 Gm. (1⅔ ounces) of proteid (vegetable) daily and no more. As eliminants, purgatives are not advised, **hot baths** being far better, with **moderate exercise** and **cessation of strenuosity and worry.**

The **few protein diet treatment** advocated by L. Faugères Bishop (Med. Rec., Sept. 20, 1913) consists of such drugs as are indicated in the individual case and in the **removal from the dietary of all meat, fish, eggs, and stock soups,** the administration of serial doses of **castor oil,** and the institution of a course of physical training suited to the individual. The **proteins are then returned to the diet one at a time,** beginning with cheese, which seems to be the safest of all. **Fruit, vegetables, bread, butter,** and **cereals** are allowed **without restriction.** This diet, **"few protein" diet,** in contradistinction to the "low protein" diet of other writers, is founded upon the belief that damage is due to protein poisons that are specific to the individual, and that if they are harmful at all, small quantities may be nearly as bad as larger amounts. The discovery of the proper diet must depend upon study of the particular person. The offending protein may be one that has been abused, and often enough it may be the one most craved when it is taken away.

digitalis in, ii. 188; iv. 140, 149, 158
diuretin in, ii. 188; iv. 335

A. Pick (Med. Klinik, May 12, 1912) has found that in disturbances of digestion and arteriosclerosis **diuretin** acts as a specific remedy against abdominal pains, in such cases; from 2 to 3 Gm. (30 to 45 grains) are to be given daily. Tincture of **strophanthus,** in doses of 4 to 8 drops, given twice or three times daily, has also had good results.

exercise in, ii. 186
Fischer's solution in, viii. 200
free sweating in, ii. 184
glyceryl nitrate in, ii. 186
high-frequency electric current in, ii. 185

Bühler (Med. Klinik, Jan. 11, 1914) has used the **high frequency current** in 266 cases of arteriosclerosis. The blood-pressure was above 130 mm. in all but 36, and in nearly every case the application of the high frequency current for about 10 minutes caused a reduction of 5 or 10 mm. in the blood-pressure. In 120 cases the average blood-pressure was 174 mm. at first and after 7 sittings it averaged only 146 mm. Re-examination a few months or years later showed that the reduction had been permanent in a number, while in others the pressure had gradually risen again to its old figure.

hot baths in, ii. 184
iodides in, ii. 185

J. Schwalbe (Deut. med. Woch., Apr. 9, 1914) finds no agreement among competent authors with reference to the value of **iodine** in the treatment of non-syphilitic arteriosclerosis. The iodine treatment must be employed for months and years, with intermissions.

iodized fats in, vi. 6
iodothyrin in, ii. 186
Marienbad course in, ii. 189
massage in, ii. 185
muscular exercise in, ii. 185
neosalvarsan in, iv. 168
neuronal in, vii. 16
nitrites in, ii. 185, 187, 188
nitroglycerin in, ii. 187, 188
nux vomica in, ii. 188
open-air exercise in, ii. 184
opium in, ii. 186; vii. 189
oxygen baths in, vii. 275

I. L. Nascher (N. Y. Med. Jour., Nov. 22, 1913) has used the **red amorphous phosphorus** in senile arteriosclerosis for several years. Weil's experiments showed that the lime elimination in arteriosclerosis was diminished. Phosphorus has the property of combining with the lime of the food and increasing the lime assimilation. When given as amorphous phosphorus the dose is 2 grains (0.13 Gm.) or more.

potassium iodide in, ii. 185, 186, 187; vi. 24

Grief and worry are important in the etiology of arteriosclerosis, according to Herz (Med. Klinik, Aug. 24, 1913). He holds that the physician who does not apply **psychotherapy** in the treatment of arteriosclerosis neglects one of the most effectual means at his command.

quantitative reduction of food in, ii. 184

C. E. Field (Med. Rec., Jan. 22, 1916) recommends **radium** by emanation, inhalation, radioactive drinking waters, solutions of radium salts for drinking, emanation baths, and, by intravenous or subcutaneous route, the bromide or chloride of radium. It has absolutely no toxic effects and the dose in high blood-pressure is governed by the chronicity of the case and the involvement. In a series of 190 cases, the average systolic pressure was 190 and the average reduction was 40 mm.

Royat course in, ii. 189
sajodin in, ii. 186
saline cathartics in, ii. 185, 188
sex gland implantation in, vii. 360
sodium bicarbonate in, ii. 187
sodium iodide in, ii. 186
sodium nitrite in, ii. 186, 187
spirit of nitrous ether in, ii. 188
strontium bromide in, ii. 188
strontium iodide in, viii. 409
strophanthus in, ii. 188
sulphonal in, ii. 187
tepid douches in, ii. 186
theobromine sodium salicylate in, ii. 189
thiosinamine in, ii. 189; viii. 530
thyroid gland in, i. 730; ii. 186
trional in, ii. 187

Sergent and Cottenot (Bull. Méd., Mar. 4, 1914) tried **X-rays** over the adrenals in vascular hypertension. In the 4 cases in which the high blood-pressure was clearly due to arteriosclerosis, 3 were benefited, though not to a great degree, and the fourth case not at all. The treatment for persistent bleeding from sclerosis of the uterine vessels has been hysterectomy. W. P. Healy (N. Y. Med. Jour., May 15, 1915) holds, however, that the X-rays are often effective in the control and cure of these hemorrhages, and may be used without fear of any harmful effect upon the ovaries, as then patients are all at or beyond the menopause.

venesection in, ii. 184, 185
veratrum viride in, ii. 188; viii. 806
incipient, **nitrites** in, vii. 56
with angina, electrocardiogram, v. 325
Arteriosclerotic colic, **diuretin** in, iv. 335
Arteriovenous aneurism, i. 683, see Aneurism.
Arteritis, acute, viii. 797
ammonium chloride in, viii. 797
food, nourishing, in, viii. 797
mercurial ointment in, viii. 797
opium in, viii. 797
rest, absolute, in, viii. 797
tonics in, viii. 797
warmth in, viii. 797
chronic, see Arteriosclerosis, ii. 147; also this Index.
plastic, viii. 797
suppurative, viii. 797
Arthralgia, **adrenalin** in, i. 774
Arthrectomy, vi. 106
Helferich's method, vi. 137
Arthritic pain, **tropacocaine** in, viii. 591
Arthritis, acute, vi. 101

McCrae (Penna. Med. Jour., Apr., 1916) states that if there is doubt in the diagnosis of an acute arthritis, as there may be for some days, it is wiser to feel that other forms of arthritis have to be excluded, and it is better to make the diagnosis of rheumatic fever last. Permanent changes in or about a joint, even though very slight, speak against rheumatic fever. The finding of the original focus of infection is most essential. In most cases the search is difficult.

active motion in, vi. 104
adrenalin in, i. 774

Arthritis, acute (*continued*).
  - alcohol in, i. 532
  - amputation in, vi. 105, 106
  - antiseptic solutions in, vi. 104
  - aperient waters in, vi. 711
  - arthrectomy in, vi. 106
  - arthrotomy in, vi. 105
  - aspiration in, vi. 104, 105
  - Bardenheur's extension in, vi. 104
  - Bier's hyperemia in, vi. 104
  - blisters in, iii. 676
  - boric acid in, vi. 105
  - drainage in, vi. 105
  - electric-light cap in, vi. 104
  - erasion in, vi. 106
  - exalgin in, iv. 711
  - extension in, vi. 103, 104, 105
  - fixation in, vi. 104
  - formaldehyde in, vi. 105
  - gaultheria in, v. 12
  - gonococcus vaccine in, ii. 351
  - heat in, vi. 104
  - high-frequency currents in, iv. 427
  - ice in, vi. 103
  - ice-bag in, iii. 530
  - ichthyol in, v. 635
  - injections into joint in, vi. 104, 105
  - iodoform glycerin in, vi. 37
  - iodoform oil emulsion in, vi. 37
  - irrigation of joint in, vi. 105
  - leeches in, vi. 103
  - magnesium sulphate in, vi. 477
  - mercury bichloride in, vi. 105
  - mustard plaster in, iii. 677; vi. 774
  - passive motion in, vi. 104
  - phosphoric acid in, vii. 450
  - resection in, vi. 105, 106
  - rest in, vi. 103, 104
  - salicylates in, vi. 104
  - saline solution in, vi. 104, 105
  - sling in, vi. 104
  - splint in, vi. 103
  - sweating in, vi. 104
  - tapping joint in, vi. 104, 105
  - tonics in, vi. 104
  - wet cups in, vi. 103
- atrophic, vi. 110, 111
- chronic, vi. 104, 106

Diagnosis.—Ellermann (Med. Klinik, Feb. 14, 1915) found *enlarged lymph glands at the elbow* in 50 per cent. of the 28 adult patients with typical chronic polyarthritis.

Etiology, vi. 102.—Sever (Boston Med. and Surg. Jour., Sept. 9, 1915) refers to 6 cases representing various methods of infection by the pneumococcus, namely: (1) From the mouth by way of a tooth infection. (2) By trauma without previous known pneumonia. (3) By a previous pneumonia followed by an otitis media. (4) By trauma followed by pneumonia and involvement of the joint in nine days. (5) Following several attacks of bronchopneumonia and immediately after an acute attack of otitis media. (6) Involvement of joint two weeks after an acute attack of lobar pneumonia.

In a careful examination of the extracted *teeth* of 220 patients, T. B. Hartzell (Jour. Amer. Med. Assoc., Sept. 25, 1915) isolated the *streptococcus viridans* in every instance. The arthritis of dental origin seems to be always due to this germ. It is characterized by slow onset with exacerbations and remissions, the exacerbations apparently being coincident with the filling of dental pockets with pus or the retention of pus in pyorrhea pockets.

J. J. King (N. Y. Med. Jour., June 17, 1916) believes that *throat infections in general* are caused by the Conellan-King diplococcus, an organism growing best in moisture, veal agar, or human blood agar. It is analogous to the Klebs-Loeffler and tuberculosis bacilli found in the aural and nasal secretions. The patients give a history first of having tonsillitis, later rheumatism, and finally arthritis. Out of 61 unselected cases of chronic arthritis investigated, Roland Hammond (Jour. Amer. Med. Assoc., Sept. 25, 1915) found 28 which gave negative evidence regarding *nose and throat infection* and 30 which gave positive evidence. Many of the latter showed involvement of the *tonsils*.

All the various forms of polyarthritis may be caused by infections, according to P. W. Nathan (Jour. Med. Research, May, 1917). The pathologic lesions correspond exactly with those of known infections and the clinical phenomena can all be ascribed to differences in the location and virulence of the bacteria, the mechanical conditions and the presence or absence of central or peripheral nerve involvement.

The etiological factor, according to F. Billings (Trans. Amer. Med. Assoc.; N. Y. Med. Jour., June 23, 1917), is usually a strain of streptococcus, not necessarily virulent. The same morbid anatomy is produced sometimes by the gonococcus. It was peculiar in that the infection is usually hematogenous. The joints invite infection more than any other tissue of the body, and the interference with the blood-supply makes the character of the infection different from that of other tissues. A characteristic of infection through the blood-stream is destruction of vessels; there are hemorrhages, and changes occur in the nutrition of the joint resulting in retrograde metabolism.

Treatment, vi. 106.—Pemberton (Amer. Jour. Med. Sci., May, 1917) found it possible to relieve patients of practically all symptoms of diffuse arthritis by a large curtailment of carbohydrate, coincidently with the ingestion of fat in such increased amounts as to make up or exceed this caloric deficit. When the protein intake has been kept approximately constant some such patients actually gained weight while convalescing.

apparatus in, vi. 104, 107-109
belladonna ointment in, ii. 444; vi. 108

Linberger (Münch. med. Woch., Feb. 29, 1916), since Sehrt has reported results from the continuous application of the constricting band to induce **Bier's stasis hyperemia**, obtained excellent results with it in 8 cases. It permitted exercise earlier, and the functional use of the limb was regained sooner and better than with other methods.

In Bottomley's cases (Amer. Med. Assoc.; Med. Rec., July 1, 1916) the relief from **colectomy** was temporary. One case remained cured 3 years; another 10 months. It is desirable to exclude .infections of the sinuses, ureters, seminal vesicles, vagina, and other possible sources before turning to the intestinal tract. The neuromuscular apparatus of the bowel in intestinal stasis is at fault, not the adventitious bands. J. W. Draper (Amer. Med. Assoc.; Med. Rec., July 1, 1916) reports the case of a woman in the terminal stage of polyarthritis who was unable to use her hands to write or handle her knife and fork, but who was able to turn over in bed in 24 hours after **hemicolectomy.**

Rea Smith (Jour. Amer. Med. Assoc., Aug. 28, 1915) for the last 2 years has been studying, from Arbuthnot Lane's point of view, all the cases of chronic arthritis in his practice. Fluoroscopic examinations of 18 cases of arthritis showed marked ileal stasis, usually associated with a dilated prolapsed cecum with evidence of colon stasis as well. He found by bacteriologic examination of the walls of the colon and ileum in arthritis the growth of streptococcus viridans mostly in the ileum, while cultures from walls of 3 other colons removed for other causes than arthritis showed no viridans. No operations were performed on borderline cases; only patients who had gone through all the other resources have been operated, 14 in all. In 2 he did **ileocolostomy** and **colectomy** at one operation. Both patients made good surgical recoveries and are remarkably benefited as to their arthritis. The remaining 12 were **short circuiting operations**; one patient, operated on as a last resort, died. Five made good recoveries, the joint symptoms disappeared and 3 were able to resume their occupations with little or no pain and less disability than could be expected. The remaining 6 had early temporary improvement, 4 have since had a secondary colectomy, 1 has relapsed and 3 have greatly improved. All are able to walk without assistance.

complete fixation in, vi. 107
constitutional treatment in, vi. 106

Arthritis, chronic (*continued*).
  crutches in, vi. 109

In arthritis of dental origin, the treatment employed by Hartzell (Jour. Amer. Med. Assoc., Sept. 25, 1915) consists in **curettage** and **evacuation of dental abscesses.** This also inoculates the patient with a large number of organisms, inducing an effect similar to that of an efficient vaccine, with the added advantage that the constant supply is shut off from the focus disturbed. When many pyorrhea pockets or abscesses exist, it is important to permit from three to six days to intervene between treatments in order to gain the full advantage of what might be called surgical autoinoculation.

  Davis's traction splint in, vi. 109
  elastic knee cap in, vi. 109
  electricity in, vi. 108

In all cases of arthritis occurring in troops Moorhead (Brit. Med. Jour., Apr. 1, 1916) urges that if a history of dysentery is obtained, a course of **emetin** should at once be ordered. In 6 cases emetin cleared up the arthritis most rapidly after other treatment failed.

  extension in, vi. 109
  high shoe in, vi. 109
  hot-air baths in, vi. 108
  ichthyol ointment in, vi. 108
  immobilization in, vi. 107
  iodine in, vi. 108
  leather splints in, vi. 107, 109
  mercurial ointment in, vi. 108, 671

Zueblin (N. Y. Med. Jour., Aug. 19, 1916) reports a series of cases in which radioactive substances, such as **mesothorium,** locally applied to the diseased joints produced a remarkable change in the subjective and objective symptoms of acute and chronic deforming arthritis. Pain was relieved, the infiltration of the articular and periarticular structures became less noticeable, and a reduction of the synovial fluid and a gain in the active and passive motility was noticed.

  orthopedic apparatus in, vi. 108
  plaster-of-Paris bandage in, vi. 107, 109

Arthritis, chronic (*continued*).
  rest in, vi. 107
  side irons in, vi. 109
  sling in, vi. 108
  sodium silicate bandage in, vi. 107-109
  splints in, vi. 107-109

According to A. B. Hirsh (Jour. Amer. Med. Assoc., Oct. 9, 1915), the most efficient local treatment is the high pressure, small volume and low frequency **static wave current** sent through 22-gauge flexible metal plates closely fitting the involved joints. The static indirect sparks are also applied between these joints. Of the several modalities no single one will suffice, but their intelligent combination proves effective.

  Taylor's traction splint in, vi. 109
  Thomas's posterior splint in, vi. 109

Autogenous vaccines made up of the dominating strains of streptococci obtained from the tissues and exudates of the focus of infection have been used by Billings (Ills. Med. Jour., Sept., 1914). The dose used has been from 100,000,000 to 1,000,000,000. The large dose does not seem to be any more effective than the small one. The use of autogenous vaccines appears to increase the defenses of the body as judged by a study of the opsonins and phagocytic index. According to J. J. King (N. Y. Med. Jour., June 17, 1916), the prognosis in general is good in arthritis of tonsillar or nasal origin, when the patients received an injection of **autogenous vaccine** from the Conellan-King diplococcus twice a week in doses of 200,000,000, followed by enucleation of the tonsils after the temperature had dropped and the soreness of the joints had ceased. The focus of infection was apparently at the roots of the teeth.

chronic rheumatoid, **thyroid gland** in, i. 730
deformans, vi. 109

Etiology, vi. 110.—In nearly all of a series of 64 cases of arthritis deformans in which glands excised under strict aseptic conditions were examined by Rosenow (Lancet-Clinic, cxiii, 32, 1915), organisms were found, although the cases ranged in duration from 1 to 17 years. Several organisms were found in some glands; in no case were the streptococci hemolytic for human blood, but they resembled streptococcus viridans, and showed anaërobic preferences in the primary cultures. According to Hastings (Jour. of Exper. Med., July, 1914), probably 40 per cent. of cases of arthritis deformans should be considered as chronic infective deforming arthritis due to streptococcus viridans. Rarely the clinical manifestations of arthritis deformans may be due to gonococcus infection.

D. Silver (Trans. Amer. Orth. Assoc., May, 1916; Surg., Gynec., and Obstet., Aug., 1916) holds that in many cases in which *visceroptosis* and its resulting alimentary toxemia coexist, the visceroptosis is of the secondary acquired type; further, that in any case in which there is a primary visceroptosis of sufficient degree to interfere with function it necessarily acts as a predisposing factor in the production of the arthritis and may be the deciding factor. He concludes that it seems demonstrated that the active agent in arthritis deformans may enter through the intestinal tract. This active agent is undoubtedly bacterial, most commonly streptococcic. Through stasis, and probably also through its influence on glandular secretions, visceroptosis causes increased intestinal infection and so favors systemic invasion.

Treatment, vi. 114.—Many cases are due, according to Senger (Berl. klin. Woch., Mar. 6, 1916), to trauma, to syphilis, to gonorrhea, and to other infections. A considerable proportion of such cases is curable, and it is, therefore, of prime importance to discover the cause in any given case before considering it as incurable.

aconite in, vi. 118
aponeurotomy in, vi. 119
arsenic in, ii. 141; vi. 116, 117, 119
bacterins in, vi. 111, 116

Arthritis deformans (*continued*).
  baking in, vi. 115
  bandaging in, vi. 118
  baths in, vi. 115, 118, 119
  betanaphthol in, vi. 114
  Bier's hyperemia in, v. 594; vi. 115, 117
  buttermilk in, vi. 115
  calcium carbonate in, vi. 116
  calcium chloride in, vi. 116
  calcium glycerophosphate in, vi. 116
  calcium lactate in, vi. 116
  camphor in, vi. 118
  castor oil in, vi. 114
  cheilotomy in, vi. 120
  chloral in, vi. 118
  chloroform liniment in, vi. 117
  climate in, vi. 114
  codliver oil in, vi. 118, 119
  inunctions in, iii. 512
  colchicum in, iii. 528
  cold applications in, vi. 117
  compression in, vi. 119
  diet in, vi. 114, 115, 116, 118, 119
  Donovan's solution in, vi. 119
  douches in, vi. 118
  elastic bandage in, vi. 119
  electricity in, vi. 108, 115, 117, 118
  enemata (high) in, vi. 115
  excision in, vi. 119
  exercises in, vi. 115
  extension in, vi. 119
  fermented milk in, vi. 115, 119
  fibrolysin in, vi. 117
  fixation of joint in, vi. 117
  fresh air in, vi. 119
  galvanic current in, vi. 118
  gelsemium tincture in, vi. 118
  guaiacol in, v. 147; vi. 114, 116, 119
  gymnastics in, vi. 117
  high-frequency current in, vi. 118
  hot air in, vi. 118, 119
  hot-air baths in, vi. 108, 119
  hot compresses in, viii. 814
  hydrochloric acid in, vi. 116
  hygiene (personal) in, vi. 114
  hyoscyamus tincture in, vi. 118
  iodides in, vi. 114, 116
  iron iodide in, vi. 118
  iron perchloride in, vi. 116
  iron preparations in, vi. 116, 118, 119
  lactic acid bacilli in, vi. 115
  lavage of colon in, vi. 114, 115
  leeches in, vi. 117
  light baths in, vi. 115
  lithium in, vi. 367

Arthritis deformans (*continued*).
  magnesium sulphate in, vi. 114
  massage in, vi. 108, 115, 117, 118
  mechanical vibration in, vi. 118
  mercury benzoate in, ii. 553
  methylene blue in, vi. 686
  mineral waters in, vi. 118
  modeling in, vi. 119
  Morton wave current in, vi. 118
  moving joint in hot water in, vi. 118
  ovarian extract in, vi. 113
  Paquelin cautery in, vi. 117
  passive movements in, vi. 111, 117, 118
  potassium chloride in, vi. 116
  potassium iodide in, ii. 553; vi. 38, 114, 116
  protection of joint in, vi. 114, 117
  purgation in, vi. 114
  pyramidon in, vi. 118
  pyroligneous acid in, vi. 117
  radium in, viii. 829
  rest in, vi. 114, 117, 118
  restoration of nutrition in, vi. 114
  rhamnus purshiana in, vii. 822
  salicylates in, vi. 104, 116, 118
  sodium bicarbonate in, vi. 116
  sodium cacodylate in, ii. 705
  sodium chloride in, vi. 116
  sodium salicylate in, vi. 116
  sodium sulphate in, vi. 116
  splint in, vi. 117
  stasis in, vi. 115, 117
  static current in, vi. 115, 118
  steam boxes in, vi. 115
  streptococcus vaccine in, ii. 346
  strontium bromide in, vi. 118
  strychnine sulphate in, vi. 118
  sulphur in, viii. 429
  sulphur waters in, vi. 117
  supporting apparatus in, ii. 552
  tenotomy in, vi. 119
  thymus preparations in, vi. 114, 116
  thyroid preparations in, ii. 553; vi. 115
  Turkish baths in, vi. 119
  vaccine in, vi. 111, 116
  vaccine (autogenous) in, vi. 116
  woolen cloths (hot) in, vi. 117
  wrapping the joint in, vi. 117
  X-ray in, viii. 828
 chronic, thyroid gland in, i. 730
 gelatinous, see Arthritis, Tuberculous, vi. 127; also this Index.
 gonorrheal, vi. 107; see also Rheumatism, Gonococcal, viii. 26, and this Index.

In 443 cases of gonorrheal arthritis Chiari (Centralbl. f. d. Grenzgeb. d. Med. u. Chir., Sept., 1914) applied vaccine therapy with autogenous or commercial vaccine. Only 41 cases were uninfluenced; 32 patients were improved and 367 cured.

hypertrophic, vi. 110, 112
infectious suppurative, vi. 102, 104, 110

Diagnosis, vi. 110.—Chaput (Presse méd., Apr. 15, 1915) points to the frequency with which *purulent arthritis complicating a fracture* of a long bone is overlooked. The diagnosis is most difficult where the fracture involves the shaft of the bone near the epiphysis. The diagnosis is based on the following features: 1. When the joint is opened and examined, a fissure may be noticed in the epiphysis. 2. The methylene blue test, consisting in the injection into the joint of enough sterilized methylene blue solution slightly to distend the joint; in a few seconds the focus in the bone will be colored blue if communication exists between the joint and bone foci. 3. Induction; whenever, in fracture near a joint, with satisfactory drainage, fever persists, joint suppuration may be suspected to exist.

Etiology, vi. 119.—The frequency of *meningococcic suppurating arthritis* as a complication of meningococcic infection, which occurs oftener than any other complication except otitis, is emphasized by Netter and Durand (Bull. de l'Acad. de Méd., Apr. 13, 1915). In 200 cases of cerebrospinal meningitis the authors met with 11 cases of joint involvement, or 5.5 per cent.

  alcohol in, vi. 103
  aluminum acetate in, vi. 103
  amputation in, vi. 106
  apparatus in, vi. 104

Fieux (Presse méd., Mar. 9, 1916) in suppurative arthritis of the knee due to gunshot wounds, urges that the defect in the present treatment is inefficiency of drainage. Pus is retained in the serous cavity, notwithstanding the presence of large permeable tubes, and this is due to the

fact that, behind and around the drains, the serosa becomes completely shut off, the articular cavity being replaced by a spongy, purulent mass. To avoid this, he substitutes for arthrotomy and drainage an arthrostomy or marsupialization of the synovial membrane. In beginning acute arthritis a single opening has appeared sufficient.

aspiration of joint in, vi. 103, 105
autogenous vaccine in, vi. 107
bandage in, vi. 103
constitutional treatment in, vi. 106
drainage in, vi. 103, 106
electric baking in, vi. 102, 103
evacuation of joint in, vi. 103, 105
extension in, vi. 105
fomentations in, vi. 104
formaldehyde in, vi. 105
heat in, vi. 103
incision in, vi. 103, 106
injections into joint in, vi. 105
iodine in, vi. 105
iodoform emulsion in, vi. 106
irrigation of joint in, vi. 106
liquids increased in, vi. 102
magnesium sulphate in, vi. 475
massage in, vi. 105
meats forbidden in, vi. 102
mechanical devices in, vi. 103
morphine in, vi. 105
phenol camphor in, vi. 106
plaster cast in, vi. 105
protection of joint in, vi. 104
removal of infectious focus in, vi. 103

O'Conor (Lancet, July 25, 1914) resorts to operation in patients who do not promptly yield to medical treatment (sodium salicylate ½ dram—2 Gm., sodium bicarbonate 1 dram—4 Gm., 3-hourly; salines, milk diet, woolen clothing, etc.). All infected joints are opened, flaky turbid lymph is evacuated, free irrigation with warm oxygen water, drainage tubes inserted and retained *in situ* for 3 days. Multiple incisions are made into areas of periarticular cellulitis and hot mercurial fomentations applied. Splints are employed for immobilization purposes for from 7 to 10 days, at the end of which the patient is requested to commence graduated active movement. When wounds are healed gentle massage is ordered.

rest in, vi. 103
saline solution in, vi. 106
separation of joints in, vi. 103
sodium benzoate in, vi. 102
streptococcus vaccine in, vi. 107

In a study of 20 cases H. K. Nicoll (Jour. Amer. Med. Assoc., Dec. 19, 1914) noted the following facts: 1. The administration of horse serum may be followed by anaphylaxis in 25 per cent. of cases. 2. Heating and aging of serum fails to remove its toxicity. 3. An estimation of the immune bodies showed no advantage over the use of antiserums of less potency commercially prepared. Acute streptococcus infections occurred in 2 cases. 4. Concentrated serums were not successful. He concluded, therefore, that the use of antistreptococcus serum in the treatment of chronic arthritis is not justifiable.

traction in, vi. 103
tuberculin in, vi. 105
water dressings in, vi. 103
wet dressings in, vi. 103
metabolic, vi. 110
of gout, vi. 120
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puerperal, Bier's hyperemia in, v. 597
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  static, see Arthritis, Tuberculous, vi. 127; also this Index.
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  Mosetig-Moorhof's method in, vi. 135
  nux vomica in, vi. 138
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  saline solution in, vi. 134
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  spica bandage in, vi. 133
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  strapping in, vi. 131, 132
  strontium iodide in, viii. 408
  suction hyperemia in, vi. 133
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Rollier (Correspondenzbl. f. schweizer Aerzte, Dec. 19, 1914) was led to conclude by 2000 cases of tuberculous bone and joint disease treated during the last 10 years, that exposure of the body to the sunlight could cure such lesions at all ages. In Pott's disease the patient is kept lying prone with his back exposed to the sunlight. The disease is thus cured while the position tends to correct the deformity. He does not use plaster, but only such extension apparatus as will permit of the development of the muscles. He reports 158 cases of hip joint disease thus treated, of which 125 were cured, 102 with restoration of function. Of 120 knee cases, 106 were cured, 78 with restoration of function, and of 198 cases of Pott's, 171 were cured and 18 improved.

  tapping in, vi. 133
  Taylor's splint in, vi. 132
  tenotomy in, vi. 130
  thyroid preparations in, vi. 138
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Arthritis, tuberculous (*continued*).
  trephining (multiple) in, vi. 134
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  tuberculin in, ii, 381; vi. 138
  vaccine in, vi. 138
  wood splint in, vi. 132
  X-rays in, vi. 134
Arthropathy, tabetic, see Charcot Disease, vi. 121; also this Index.
Articular fever, eruptive, see Dengue, iii. 783; also this Index.
Articular paste, vi. 147
Articular rheumatism, acute, see Rheumatic Fever, viii. 1; also this Index.
Articular wax, vi. 147
Artificial anus, closure of, infiltration anesthesia in, iii. 497
  leech, see Leeching, vi. 315; also this Index.
  menopause, corpus luteum in, i. 789
    ovarian extract in, i. 787
  pneumothorax, iii. 180; viii. 622
  respiration, iv. 337
    Howard method, v. 6
    Schäfer "prone pressure" method, v. 8
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Ascariasis, cajuput oil in, ii. 709
  iron chloride tincture in, vi. 89
  naphthalene in, vi. 785
  rue in, viii. 44
Ascarides, see Ascaris.
Ascaris alata, vii. 308
  lumbricoides, vii. 303

An experimental study by F. F. Stewart (Brit. Med. Jour., Oct. 7, 1916) showed that ripe eggs of Ascaris lumbricoides swallowed by rats or mice merge, and their larvæ enter the animals' livers by the bile ducts or by boring through the venules of the portal system. In the liver they cause rapid degeneration of the neighboring cells, enter the hepatic vein, and gain access to the lungs. From these they soon pass by way of the air cells into the bronchi and appear in the animals' saliva about eight days after the initial infection. From the mouth they are conveyed by the saliva to articles of human food and lead to infection in man. These common rodents are, therefore, probably the usual intermediate hosts of this parasite and are the agents in its spread.

Ascaris lumbricoides (*continued*).
    calomel in, vii. 304
    castor oil in, vii. 305
    colocynth in, viii. 75
    menthol in, vii. 305
    naphthalin in, vii. 305
    oleum chenopodii in, vii. 305
    operation in, vii. 305
    rue in, viii. 44
    santonin in, viii. 72
    santoninoxim in, vii. 304
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    spigelia extract in, vii. 305; viii. 201
  splenomegaly in, viii. 307
  trichiuria, see Trichocephalus Dispar, vii. 308
  vermicularis, see Oxyuris, Vermicularis, vii. 305; also this Index.
Ascites, ii. 190, 197; vii. 365; see also Dropsy and Edema, this Index.

Etiology.—Cabot (Pub. of Mass. Gen. Hosp., Jan., 1913) recalls that among the possible causes of extensive ascites are *small solid tumors of the ovary;* that pleural effusions may be produced by an extensive ascitic accumulation—an association that may lead to a false diagnosis of pleural and peritoneal tuberculosis—and that cure of both pleural and peritoneal effusions may result from excising a benign tumor.

According to Wienskowitz (Berl. klin. Woch., Oct. 26, 1914), congenital dropsy with fetal anemia—a relapsing case of which the author describes—is evidently the result of a toxic influence upon the fetal blood-formation, in all probability derived from the mother. The nature of this toxic substance is quite unknown.

C. Bolton (Brit. Med. Jour., May 26, 1917) contends that the accumulation of fluid in the peritoneal cavity in cardiac dropsy following an incomplete obstruction of the inferior vena cava in the chest, or in uncompensated heart disease, is due to an increased output of lymph from the viscera, more especially the liver, which is constantly occurring at all stages of the disease.

  absorption of fluid in, vii. 368
  adrenalin in, ii. 199
Ascites (*continued*).
  autoserotherapy in, ii. 200; vii. 369

Vitry and Sézary (Revue de Méd., Feb., 1913) cite an undoubted case of cirrhosis, with atrophied liver, splenic enlargement, prominent collateral circulation, and positive methylene blue test, in which **autoserotherapy** and other measures led to rapid absorption of an ascitic accumulation of 6 months' standing. Subcutaneous injections of 10 c.c. (2½ drams) of ascitic fluid were continued on alternate dates. On the third day a free flow of urine set in, with the result that 11 days later the ascites had disappeared. The patient was subsequently given salt-free food, then placed on a careful chloride-containing diet, with the result that ascites and the symptoms due to portal congestion have not returned.

[Autoserotherapy has been resorted to in the most varied forms of ascites, and the only contraindication is a purulent ascitic fluid. Small subcutaneous injections should be tried first. It is the only method permissible in tuberculous ascites, and here it is advantageous to combine it with laparotomy and proteolysis. In Laënnec's cirrhosis massive intravenous injections may be successful, but they are absolutely contraindicated in tuberculous ascites as they contribute markedly to generalization of the process. Another contraindication is renal impermeability, because in such cases the toxic substances which should be contained in the urine, pass into the pleural collection. Otherwise, ascitic autotherapy appears to be a method of remarkable innocuousness. Pron, alone, has mentioned a local complication, a hard edema on the entire right side, without the redness of a lymphangitis, which lasted several days. C. E. de M. S.]

  blue mass in, vii. 368
  calomel in, vi. 678; vii. 368
  catharsis in, vii. 368
  copaiba in, iii. 641
  digitalis infusion in, vii. 368
  diuresis in, vii. 368, 369

Usually in true cirrhosis the portal vein is so tied up in adhesions that a true Eck fistula is not feasible. Edward Martin and J. E. Sweet (Jour. Amer. Med. Assoc., Oct. 16, 1915) devised a **modification of the Eck fistula** consisting of an anastomosis of one of the large mesenteric veins with the iliac vein at the point at which they cross. That is a more positively curative procedure than the operation advocated by Miller, which amounts to continuous tapping.

elaterium in, iv. 415; vii. 368
ether in, iv. 639
free purgation in, vii. 368
gold in, v. 74
hematics in, ii. 199
jalap in, vi. 90; vii. 368; viii. 97

The **Karell diet** has served Goodman (Arch. of Internal Med., June, 1916) best. The patient receives daily at 8 A.M., 12 M., 4 P.M., and 8 P.M. 200 c.c. (⅖ pint) of raw or boiled milk, warm or cold, according to taste. No other food or liquid should be given. This meets with violent opposition from the patient, owing to thirst, which is particularly tormenting during the first 3 or 4 days. The patient can rinse out his mouth with water, but he must swallow none. Hunger, if too urgent, may be relieved by giving a small piece of dry toast or zwieback with each portion of milk. During the first few days the patient requires continual encouragement to persist with the treatment, but the moral effect of the rapid loss of weight, as shown by daily weighings, together with the very evident decrease of the edema, prove sufficient argument to him, and no further complaint is heard.

The diet may usually be increased at the end of a week's time by giving a soft-boiled egg, without salt or pepper, at 10 A.M., and a piece of zwieback at 6 P.M. The next day an egg may be given at 10 A.M. and at 2 P.M., with a piece of white bread, and from now on food is gradually increased until a full diet is being taken. During this time the daily quantum of liquid should not exceed 800 c.c., (⅘ quart) and this fluid should be in the form of milk, until the patient receives a full diet, when the milk may be discontinued and cocoa or tea substituted, the amount of liquid remaining the same, however. No more than 800 c.c. of fluid should be taken for from 2 to 3 weeks after the disappearance of ascites. During the treatment, which must be carried out with the patient in bed, the bowels must be kept open, and for this purpose laxatives in pill form are preferable to salines, merely because they require no water for their administration.

[Our Associate Editor, James M. Anders, holds that the **Karell cure**, which is much more used abroad than in America, is, in the opinion of His, not only effective in renal and cardiac dropsy, but alleviates the disturbance in breathing and other distressing symptoms not dependent upon the edema present in many of these cases. Prof. Anders deems it valuable before actual decompensation has taken place; for example, in cases of aortic valvular disease showing simply premonitory symptoms, associated perhaps with a mild grade of arteriosclerosis. After positive involvement of the kidneys and the presence of uremia it is altogether contraindicated. He does not advocate the use of the treatment in valvular disease with dropsy in which the kidneys are intact, but in all such cases there should be allowed more food of a higher caloric value, with aid to elimination by other means, such as **rest, cardiac stimulants**, etc. The use of **iron** is of advantage with the Karell cure. C. E. de M. S.]

lymphangioplasty in, ii. 200
magnesium sulphate in, vi. 474
mercurials in, vii. 368

W. C. G. Kirchner (Med. Rec., Feb. 5, 1916) tried the **Oberst operation**. The operation consists in the employment of a pedunculated portion of the skin from the abdomen, which is buried subcutaneously in such a manner that a flap projects into the abdominal cavity. Thus no substance foreign to the body is used in providing continuous drainage. The author's cases were not especially well suited for a successful trial of the method, but in 1 of 4 cases, the ascites being due to alcoholic cirrhosis of the liver, a satisfactory result was obtained, there being no return of the ascites.

omentopexy in, ii. 200

Operations are to be considered proper in such a fatal condition as ascites due to hepatic cirrhosis, according to Binnie (Interstate Med. Jour., Apr., 1912), even when they promise only a very moderate amount of success. As the patients are usually in poor condition for resisting trauma, severe operations are improper. The operation of choice, and much superior to mere paracentesis, is some form of **omentopexy** or of **lymphangioplasty.** Drainage into the veins may be proper when milder measures fail. All means of direct anastomosis between the portal vein and the inferior vena cava are probably unjustifiable.

oxygen injections in, ii. 200

paracentesis in, vii. 300, 368, 369

Max Klotz (Berl. klin. Woch., xlix, 73, 1912) points out that the withdrawal of the ascitic fluid by **paracentesis** in the tuberculous peritonitis of children, is not always dangerous or useless. Out of 11 cases he mentions 5, in 2 of which a single tapping was sufficient to permanently cure the ascites. Two cases required 2 tappings to accomplish this, and 1 case required 4 tappings. The indications for tapping in this condition are: when there is an increase in, or no decrease of, the ascites after rest in bed, dieting, sun baths, food poor in salt and diuretics. If the fluid returns another tapping is indicated. If there is no return of fluid in 14 days the patient is allowed to sit up 1 hour at a time, gradually increasing the periods between the tappings until complete recovery.

Buth (Deut. med. Woch., June 11, 1914) recommends a **capillary tube,** the inner end of which is perforated laterally by many small holes for the distance of 1 cm. After the tube is introduced, the trocar is withdrawn and the tube is connected with a rubber tube and left *in situ* for several hours, the fluid draining off slowly. The method shortens the time consumed by the physician in paracentesis, and does away with the danger of collapse from the rapid reduction of intra-abdominal pressure.

paraldehyde in, vii. 302

pilocarpine in, vii. 469

potassium, purgative salts of, in, vii. 579

potassium acetate in, vii. 578

restriction of fluids in, ii. 199; vii. 369

Of 5 cases in which ascites was associated with cirrhosis of the liver, 4 were due to alcoholic or syphilitic cirrhosis, and the fifth almost certainly to malignant diseases. The patients varied in age from 18 to 60 years. R. T. Miller, Jr. (Jour. Amer. Med. Assoc., Oct. 16, 1915) resorted to **Routte's operation** in each case, 4 times unilaterally and once bilaterally (2 sittings); in 3 cases general anesthesia was used, and in 2 local anesthesia. The only mortality was the malignant case. In no instance was any ill effect observed from drainage of the ascitic fluid directly into the circulation. The results obtained are encouraging; so good, in fact, as to warrant recommending a trial of this method.

saline purgatives in, vii. 368

salt-poor diet in, ii. 202

scoparius in, viii. 97

serum in, ii. 201

Talma's operation in, ii. 199; vii. 369

According to A. Blad (Ugeskrift for Laeger, July 22, 1915), the literature shows that about 40 per cent. have been cured of those to whom the **Talma operation** has been applied. It is not universally successful because the outcome depends on the functional capacity of the liver. Continuous autodrainage of ascites is still in its infancy, but the results already obtained are promising, especially as it requires such an insignificant operation in contrast to the laparotomy for the Talma operation. It is applicable for all forms of ascites, and the effect becomes evident at once. The drain-tube technic seems to have given the best results, but the best material for it is still a question. Fish-bladder tubes were entirely absorbed in five months in the experiments on animals; hernial sac tissue in four months. Autoplastic fascia tissue gave the best results in the experiments on animals; it heals smoothly in place, takes nourishment from the tissues and lasts a long time.

According to J. D. Heard (Jour. Amer. Med. Assoc., Oct. 16, 1915) statistics show that from 35 to 50 per cent. of cases of ascites due to cirrhosis of the liver may be cured by an early Talma operation. Those of Ruotte, Soyesima and Miller indicate that venoperitonostomy is capable of yielding such favorable results that a further trial of this method is to be recommended.

  tapping in, ii. 199
    infiltration anesthesia in, iii. 498
  theocin in, ii. 202
  tonics in, ii. 199
chylous, ii. 203

Udaonda and Castex (Revista de la Asoc. Medica Argentina, Jan.-Feb., 1917) observed 1 of 5 cases of chylous ascites in which cancer of the stomach and liver was the primary cause of the chylous ascites. In the others it was due to a leukemic glandular disease, gastric cancer or tuberculous peritonitis.

  celiotomy in, ii. 203
  oxygen in, ii. 204
  Routte's operation in, ii. 205
  tapping in, ii. 204
in abdominal surgery, i. 55
  omentopexy in, i. 56
  Talma-Drummond operation in, i. 56
of hepatic origin, caffeine in, iii. 524
Aseptic wounds, formalin-gelatin powder in, iv. 736
Aseptol, vii. 445
Asiatic cholera, see Cholera Asiatica, v. 719; also this Index.
Asphyxia, see Resuscitation, vii. 820
  adrenalin in, i. 728, 763
  alcohol in, i. 525
  ammonia in, i. 610
  heart massage in, iii. 196
cyanotica, vii. 18
  alternate immersion in hot and cold water in, vii. 18
  artificial respiration in, vii. 18
  clear upper respiratory tract in, vii. 18
  cut and tie cord in, vii. 18
  hot bath in, vii. 18
livida, vii. 18
  artificial respiration in, vii. 18
  clear air passages in, vii. 18
  cord ligation in, vii. 18
  stimulation in, vii. 18
neonatorum, vii. 17

Mack (Jour. Amer. Med. Assoc., Aug. 28, 1915) used adrenalin in the resuscitation of newborn child after death of the mother from pulmonary embolus. After Cesarean section, and rapid delivery of the child, the latter passed through the livid stage; the heart sounds could not be heard, and to all appearance was dead. The Schultze and other methods failing to produce any appreciable results, although maintained for 40 minutes, he injected adrenalin solution 1:1000 into the stump of the cord, carrying the point of the needle well through the abdominal wall. In about 2 minutes he noticed that the cord began to pulsate, and heart sounds could be palpated and heard, and 10 minutes later with the aid of artificial respiration the child was breathing well and crying lustily.

  artificial respiration in, vii. 18, 21
  camphor in, vii. 20
  catheter in, vii. 18
  child inverted in, vii. 20
  child prone and then supine in each hand alternately in, vii. 20
  DeForrest's method in, vii. 19

C. W. Hunt (Charlotte Med. Jour., June, 1914) recommends the practice of dilating the sphincter ani with the fingers to excite respiration when there is apparent paresis of this function in the newborn.

direct insufflation in, vii. 20

E. A. Barton (Jour. Obstet. and Gynec. Brit. Emp., xxvii, 138, 1915) states that a number of autopsies on stillborn infants that had never attempted to breathe showed that in all such cases the glottis was closed. In a majority the lower half of the trachea was also occluded, the posterior muscular wall being folded into the lumen and the cartilage rings sharply flattened and incurved, so that the trachea presented on section a very flattened oval. Until the glottis is opened mechanically and the trachea is made patent it is useless, therefore, to attempt any postural or other measure to inflate the lungs. The first separation of these closed surfaces is best attained by **mouth-to-mouth aspiration.**

J. O. Arnold (Amer. Med., Sept., 1915) holds that 2 of the most important problems in the conduct of labor are: (1) study of the intrapartum condition of the child, and (2) successful resuscitation of the newborn. Every precaution should, therefore, be taken to protect the child from the dangers of asphyxiation. One should not give an anesthetic or use pituitrin, morphine, etc., without watching carefully the effect on the child. The most frequent of all causes is some interference with the fetal circulation. The child may become asphyxiated from pressure on its brain. Anesthetics, morphine, and other narcotics also endanger the child either by interfering with its oxygen supply or by direct poisoning.

In the treatment of "blue asphyxia" the author considers tossing and swinging, and the hot and cold water process questionable. He considers **mouth-to-mouth insufflation** the most effective treatment in very severe cases. He recommends most highly a **mucous aspirator,** with which he says that he is able to resuscitate all cases of "blue asphyxia." For combating "asphyxia pallida" he recommends the American-made instrument known as the **lung motor.**

ether in, vii. 20
heart massage in, vii. 21
hot and cold baths alternately in, vii. 18
immersion in hot water in, vii. 20
intubation of the larynx in, vii. 19
Laborde's method in, vii. 20
mouth to mouth insufflation in, vii. 19, 20
nasopharynx, clearing of, vii. 20

S. Marmo (Rassegna d'Obstet. e Gin.; Lancet, May 11, 1916) describes a new method of resuscitation: The operator is seated and holds the infant suspended in such a manner that the hollows of the axilla fit into the space left between the thumb and first finger. The thumbs encircling the shoulders from behind are extended forward and upward so that their radial margins and corresponding metacarpus support the head slightly, which otherwise would tend to dangle. The hollow of the hand and the 4 fingers turned forward are placed lightly on the lateral and anterior regions of the fetal thorax, which is in this way completely supported. This constitutes the *inspiratory position.* The operator now spreads out his own arms so as to draw apart the shoulders of the child, which he raises quickly a few feet and then imparts to it a sharp downward vertical movement as if to throw it to the ground and suddenly arresting its descent. The air enters the rima glottidis with a characteristic hiss. These two movements occupy no more than 2 or 3 seconds and constitute the *mechanical and passive inspiration.* Then with the hollow of the hands and with the 4 fingers which surround the thorax, and which may be spread out if necessary, the operator exerts a cautious concentric pressure without disturbing the position of the fetus. He will experience under his hands a sensation of crepitus, which indicates the exit of air, and this movement constitutes the *mechanical and passive expiration.* These move-

ments are practised 25 to 30 times a minute, and should be continued for a longer or shorter time according to circumstances. At intervals it may be necessary to put the child in a warm bath, although the movements may be very well carried out with the child wrapped from the axilla downward in warm flannel which can be changed from time to time.

Other useful effects are also obtained, such as traction on the larynx and trachea, with probable elevation of the epiglottis, widening of the rima glottidis, and depression of the lower jaw.

oxygen in, vii. 19, 274
oxygen on placenta in, vii. 20
prompt delivery of placenta and exposure of maternal surface to air in, vii. 20
pulmotor in, vii. 20

Edgar (Amer. Jour. of Obstet., Feb., 1913) has adapted the Draegen pulmotor, originally for adults, to the treatment of infants. The action of the apparatus is to inflate and deflate the lungs in a regular manner, and by the aid of a certain mechanism controlled by the hand, a given number of respirations per minute can be obtained.

single insufflation in, vii. 20
spanking in, vii. 20
sprinkling body with cold water in, vii. 20
Sylvester's method in, vii. 18, 19, 20
warm baths in, vii. 20
washing of placenta with warm water in, vii. 20
whisky in, vii. 20
wrapping in hot towels in, vii. 20
traumatic, iii. 170

Robertson (Can. Med. Assoc. Jour., June, 1914) described the effects of a stampede from a moving picture theater after a cry of "fire" had been raised. The injury usually produced by pressure on the abdomen and chest of sufficient duration to cause cessation of respiration lasting some time. The patient may be unconscious and show cyanosis of the scalp, face, neck and chest down to the third or fourth rib anteriorly. The lips and tongue may be somewhat swollen, and together with the mucous membranes exhibit the same purplish tint as the skin. The discoloration extends just over the prominence of the shoulders, and for a short distance down the back, sometimes even outlining the double triangle of the lower portion of the trapezius muscle. Closer examination of this discolored area reveals the presence of more or less scattered petechial hemorrhage. Subconjunctival hemorrhages are also common.

Yandell Henderson (Jour. Amer. Med. Assoc., July 1, 1916) states that while the best of resuscitation apparatus provide mechanical means of artificially supplying air, or air slightly enriched with oxygen, to the lungs, the danger from their use lies in the fact that too much reliance is placed upon their efficiency, and thus too often the victim is neglected while the apparatus is being brought. The most important element is prompt action and there should be universal training in the technique of the prone pressure manual method of artificial respiration. In *gas and smoke cases* oxygen should be administered at once and the only effectual method for this is by means of a closely fitting face mask and a distensible rubber bag.

artificial respiration in, iii. 171, 172
atropine in, iii. 172
oxygen in, iii. 171, 172
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Aspidinin, see Aspidium, ii. 211

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Aspirin, ii. 216; viii. 47

Administration, ii. 216.—Görges (Deut. med. Woch., June 27, 1912) states that the potassium salt of aspirin which, water free, contains about 90 per cent. of aspirin and 10 per cent. of potassium, is soluble. It is a white powder, easily soluble in water. To increase this solubility 0.15 Gm. (2⅓ grains) starch is added to each tablet, which contains 0.5 Gm. (7½ grains) soluble aspirin.

As quinine is combined with aspirin very frequently in the treatment of influenza, severe colds, and muscular rheumatism, this matter attains a position of first importance, according to an editorial writer (Therap. Gaz., Sept., 1916).

There does not seem to be any doubt that under certain conditions, which are as yet unexplained, the mixing together of aspirin and quinine results in the production of toxic manifestations. Indeed, it has been claimed that death has resulted from such a combination, and if a mixture of quinine and aspirin was the cause of death it behooves druggists to be cautious in dispensing this combination. Scoville (Jour. Amer. Pharm. Assoc., May, 1915) showed that decomposition of a mixture of quinine sulphate and aspirin sometimes takes place and a poisonous product is formed, to which the term quinotoxin has been applied.

Untoward Effects, ii. 217.—E. N. Reed (Jour. Amer. Med. Assoc., Mar. 7, 1914) observed a patient who, after taking a capsule containing 5 grains (0.5 Gm.) of aspirin was taken with vomiting in about half an hour, followed by a "stiffness" in the throat making him think he was developing a tonsillitis. An hour and a half after taking the capsule his face was swollen and cyanotic, the eyelids were edematous and almost closed and the conjunctiva injected, the whole face swollen, the breathing was labored and asthmatic, the nasal mucosa gorged, preventing nasal breathing, the buccal mucosa and pharynx were dark red and swollen, the uvula twice its normal size. The pulse was 120, soft and full, temperature 98. The breathing was such as one might expect with edema of the glottis. No treatment was instituted; the symptoms largely disappeared in 6 hours, but there was a fine, papular rash on the trunk the next morning. The patient reported a similar experience about a year before, lasting about 5 hours, after taking a capsule of 2½ grains (0.16 Gm.) each of aspirin and phenacetin.

Anderson (Can. Pract. and Rev., Sept., 1912) reports 2 cases of angioneurotic eruption due to aspirin. One of the patients exhibited a peculiar susceptibility to many drugs—such as quinine, atropine, morphine, etc.—so much so that he never prescribed anything for her when it could be avoided.

A. Klercker (Hygiea, lxxviii, No. 4, 1916) mentions 17 cases from the literature, and reports 3 seen personally, in which the use of acetylsalicylic acid was followed by edema, the lids and face swelling, the skin puffing up sometimes down as far as the chest. In some of the cases there was also a tendency to urticaria, near the swollen patches or more diffuse. In some of the cases the edema involved the mucosa of the nose and pharynx; in 2 cases there was edema of the larynx. The edema rapidly reached its height and subsided as a rule in 24 hours.

The doses administered had ranged from 0.3 to 1 Gm. (5 to 15 grains), and the pathologic reaction occurred always at the first dose, independent of the amount taken. In 2 of the cases the drug was continued without further mishap.

Aspirin (*continued*).
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Asthenia, **caffeine** in, iii. 525
Asthenic chronic bronchitis, see Bronchitis, Chronic Asthenic, ii. 648; also this Index.
  heart disorders, **caffeine** in, iii. 524
Asthma, ii. 222

Symptoms, ii. 222.—M. J. Galup (Gaz. des hôp., Mar. 14, 1914) presents some of the *clinical peculiarities of asthma which indicate* the occurrence of *anaphylaxis*: The intoxication which provokes the attack may be very slight; the attack has often a certain specificity; asthmatics are hypersensitized; the attack consists essentially of a dyspnea beginning with slow breathing and due to a spasm of the bronchial muscles; the attack is often accompanied by catarrh of the bronchi while that of hay fever is an integral part of an oculonasal catarrh, these troubles being due to a vasodilator and vasosecretory reflex; at the beginning or end of the attack asthmatics frequently vomit; an alternation of attacks of urticaria and asthma is common; eosinophilia is the characteristic cytologic finding of the sputum and has also been shown to exist at necropsy in the walls and in the lumen of the bronchi; the attack disappears as suddenly as it appeared; certain drugs have a favorable influence on asthma.

Diagnosis, ii. 225.—G. Richter (Jour. Amer. Med. Assoc., June 24, 1916) has noted that *the diseased side* occasionally *appears to lag behind the other,* while exhibiting a lesser expansion. Respiratory tracings showed, however, that the lagging behind is very rare, where it had been quite apparent on inspection. Another phenomenon was observed frequently, namely, that over certain diseased lungs, quite frequently in tuberculosis and not in acute inflammatory diseases, an inspiratory retraction of an interspace (not of all interspaces) occurs, frequently limited to a small area of such an intercostal space, while over all the other parts a distinct bulging is recorded.

In 2 cases reported by Cohen (Interstate Med. Jour., Jan., 1912) *aortic aneurism* was mistaken for asthma. The significant features were the suprasternal recession and stridor indicative of obstruction in or around the larynx or trachea, but incompatible with asthma.

The asthma skin test for anaphylaxis, according to Talbot (Boston Med. and Surg. Jour., Aug. 10, 1916), is performed as follows: A linear scarification is made about ½ inch long, and only deep enough to penetrate the outer layers of the skin, care being taken not to draw the blood. In each case an extra scarification is made as a control, because it is a well-established fact that the mechanical injury to the skin may result in a pseudo-reaction (an elevated white area surrounded by small roseola), especially in patients with an "exudative diathesis." The scarifications are then inoculated by placing the materials to be tested (preferably in fresh solution) on the scarifications, and watching them for 20 minutes. A positive reaction appears in from 10 to 20 minutes, and in rare instances a delayed reaction is seen in 1 to 2 hours. A positive reaction gives an urticarial wheal with an irregular outline surrounded by a pink blush, both of these phenomena being absent in the control. In some cases the blush, without the urticarial wheal, is so pronounced that there is no question that there is a positive reaction. Itching may or may not be present. The reaction usually disappears within ½ to 2 hours. The more delicate the skin the more sensitive it is to foreign protein, and the more readily will it react when it is unbroken or only slightly broken.

Etiology, ii. 226.—In every case search should be made, according to R. H. Babcock (Med. Rec., Aug. 2, 1913), for some form of chronic infection of the nasal accessory sinuses, in a chronic hyperplastic ethmoiditis, or in some closed cavity in any other part of the body, and, finding it, advise its removal by surgical interference.

Sverre Oftedal (Jour. Amer. Med. Assoc., May 27, 1916), following the methods of his associate, E. C. Rosenow, was able to isolate from the sputum of a number of cases of bronchial asthma streptococci which, when inoculated into susceptible animals, produced characteristic changes in the lungs. The characteristic localization of the organisms in the lungs was in the muscular coat of the bronchi. These findings harmonize with the recent observations regarding the specific affinities of many strains of streptococci with many of the clinical features of spasmodic asthma. The main difficulty of ventilation in asthma, according to Hoover and Taylor (Arch. of Internal Med., Jan., 1915), lies in the distention of the infundibula, and this fails to allow an equal diffusion of carbon dioxide throughout the alveolar air.

Dundas Grant (Pract., June, 1913) examined the nose in 107 cases of asthma, and found the conditions such as to call for operation in 68, to be abnormal but not to call for operation in 31, uncertain but probably adenoids in 1, and no nasal abnormality in 7.

Friedman and Jackson (Arch. of Internal Med., May, 1917) attribute to a circulatory cause the high CO_2 content of the alveolar air in asthma and obstructed expiration in general. The rise in intrabronchial pressure during the long expiration interferes with the free flow of blood through the pulmonary capillaries and causes a damming back of the blood on the venous side. There is a consequent accumulation of carbon dioxide in the blood with the liberation of carbon dioxide into the alveolar air.

Diphtheroid organisms were found in the sputum of 45 cases of bronchial asthma. In 30 the same type of organism was isolated; it is extremely polymorphous in growth, and care is required to differentiate between it and other organisms, such as those belonging to the staphylococcus, streptococcus, and pneumococcus groups.

Chelmonski (Deut. Archiv f. klin. Med., cv, Nu. 5-6, 1912) described 13 typical cases of asthma in all of which roentgenoscopy revealed the presence of swollen lymph-nodes encircling the bronchi. The lymph-nodes were the largest in the cases in which the asthma was most severe.

Idiopathic bronchial asthma is due to a congenital excitability of the cortical respiratory centers, produced according to Apostolides (Med. Rec., Sept. 21, 1912) by a toxemia arising from alterations of the internal secretions of certain glands (thyroid, thymus, etc.), and adds that indisputable evidence of the actual existence of this mechanism has been proved in at least 2 cases under his personal care.

In about 300 cases examined by Justus Matthews (Med. Rec., Sept. 20, 1913) at the Mayo clinic, over 90 per cent. showed the principal etiologic lesions in the upper respiratory tract, chronic suppuration or retention of mucoid secretions in the nose or accessory sinuses occurring in the majority. Relief was parallel with the degree of success obtained in securing free and continuous drainage, little attention being paid to reflex factors.

Kossler (Ills. Med. Jour., Jan., 1913) urges that there is a form of bronchial asthma which is undoubtedly due to a diathetic *anaphylaxis toward hen's eggs.* Talbot (Boston Med. and Surg. Jour., Nov. 5, 1914) recalls that scarification of the skin and inoculation with egg white will show whether egg albumin is the specific cause of the asthma. Many, if not all cases of egg asthma, may be immunized to egg white by feeding them with gradually increasing doses of egg albumin in capsules. The same author (Boston Med. and Surg. Jour., Aug. 10, 1916), referring to asthma in children, states that in 45 cases there were 13 in which the skin test gave no clue to the etiological cause of the asthma. In one case 38 tests were made before positive information was obtained; this illustrates the difficulty of finding the cause of asthma. It was found that one individual was apt to react to more than one form of protein. A definite etiological connection may, however, be established between most cases of asthma and some foreign protein by the skin test. Experience has shown that when a positive skin test is obtained for a food and the food is then removed from the diet, the general condition of the patient almost invariably improves, and in many instances a cure results.

In a study of protein sensitization, using the skin test, I. C. Walker (Trans. Amer. Med. Assoc.; N. Y. Med. Jour., June 9, 1917) found that out of 150 patients studied, 83, or 55 per cent., were sensitive to some protein and 67, or 45 per cent., were not sensitive. In the 83 sensitive cases, horse dandruff proteins were the cause of asthma in 20 per cent. of the cases; the wheat proteins, staphylococcus pyogenes aureus protein, and the early pollens were each the cause of asthma in 15 per cent.; the late pollens in 10 per cent.; cat hair protein in 5 per cent.; staphylococcus pyogenes albus protein in 3 per cent.; a group of common foods in 7 per cent., casein, egg, chicken meat, and feathers, and in the remaining 10 per cent. several proteins were the cause of asthma.

The changes in the blood with reference to the anaphylactic crisis were studied by F. Widal, Lermoyez, P. Abrami, E. Bressaud, and E. Joltrain (Presse Méd., July 11, 1914). They found an analogy between asthma and paroxysmal hemoglobinuria, and were able to vaccinate against the latter and to successfully remove the anaphylactic condition and secure a complete immunity. Autoserotherapy in asthma gave no positive results, however. The authors established a change in the blood, in both diseases, which they call "hemoclasic crisis," which consists of leucopenia, fall of arterial pressure, increased coagulability of the blood, and diminution of the refractometric index of the serum. They consider that in the asthmatic attack the respiratory symptoms, which are the only ones evident, are only one aspect of the disease, behind them being concealed an entire series of humoral changes creating in the blood-plasma physiochemical changes of which the hemoclasic crisis is the representation. The attack is, therefore, the termination of a sudden and profound disturbance which has previously taken place in the entire humoral medium.

blood-picture in, v. 384
blood-pressure in, ii. 494
bronchial, ii. 239, 241
  aconite in, i. 282, 284
  arsenic in, ii. 141
  arsenical waters in, vi. 712
  cactus grandiflorus in, ii. 708
  caffeine in, iii. 525

H. Curschmann (Münch. med. Woch., Feb. 10, 1914), asserting that he was the first to call attention to the syndrome of "intermittent Basedow bronchial asthma" and detect the presence of Chvostek's symptom, as well as bronchotetany in isolated cases of infantile bronchial asthma, tried calcium, so efficient in adults. He reports a case where administration of 1 Gm. (15 grains) of calcium lactate 3 times daily brought about a complete disappearance of the tetanic symptom complex. Calcium chloride internally was found to exert a notable prophylactic action by Kayser (Therap. Monats., Mar., 1912). After administration for 3 or

4 days of a tablespoonful of 5 per cent. calcium chloride in milk every 2 hours, the paroxysms ceased, often not to return for several months. The drug should be continued for a week. No untoward effects.

calisthenic exercise in, ii. 244
calomel in, ii. 242
cervical cold douches in, ii. 243
charcoal in, iii. 122
chloral hydrate in, ii. 246; iii. 210

In the barrel chest of asthmatics due to calcification, E. W. Andrews (Jour. Amer. Med. Assoc., Sept. 26, 1914) detached from their sternal connections the second, third, fourth, and fifth ribs, and made permanently mobile by cutting out their cartilages. Tuffier included the first rib in the procedure, but this has been found to be unnecessary. The true type for operation is the rigid chest, with little or no expansion measured by the tape; in these cases much hope of relief is offered by **chondrectomy.** In good cases vital capacity will be increased 50 per cent., or even more.

climate in, ii. 246, 247; vi. 716
cocaine in, ii. 244
colchicum in, iii. 528
compressed air in, ii. 245
corpus luteum in, ii. 241

A review of 178 cases by Allan Eustis (N. Y. Med. Jour., May 27, 1916) justified the following conclusions: 1, Most cases are due to absorption of proteolytic toxins. 2. These toxins may be absorbed from a suppurating accessory sinus in the nose or from the intestinal canal. 3. Treatment of intestinal toxemia is as important as any drainage of focal infections. 4. An alveolar abscess may be the focus from which the toxin was absorbed. 5. In the **dietetic management** of asthmatics, animal proteins, with the exception of buttermilk, should be eliminated from the dietary as much as possible.

digitalis in, iv. 158
diphtheria antitoxin, ii. 240
diuretin in, iv. 335
electric-light baths in, ii. 245, 246
endoscopic treatment in, vi. 253

Sourdille (N. Y. Med. Jour., from Presse Méd., Feb. 14, 1914) describes **Ephraim's endobronchial method** of treatment. Intratracheal sprays are insufficient to reach the bronchioles; the spraying must be done in the bronchi themselves. The instruments consist of a rubber tube with equidistant markings and a special conical and slightly bent spraying tip. The other end of the tube is connected with a 15-c.c. (½ ounce) receptacle in which are placed the solutions to be introduced. Joined to this system is a tube from a compressed oxygen tank, with safety valve blowing off at 1 kilogram pressure. The larynx is first anesthetized with **alypin-epinephrin solution,** next the upper trachea, and the larynx again with alypin-epinephrin or **cocaine spray,** and then the lower trachea and roots of bronchi with a spray of **quinine and urea hydrochloride** and **epinephrin solution.** A. Brünings spray apparatus is used in treating these parts. Next the author's bronchial spray tube is introduced as far as the upper trachea through a metallic cannula; the latter is then removed, and after coughing has subsided, the tube passed down into the left bronchus, the patient leaning to the left, rotating the head to the right, and dropping it on his right shoulder, to bring this bronchus in line with the trachea. That the tube has entered this bronchus can be definitely ascertained by running in a little oxygen and auscultating. The bronchioles are next anesthetized by spraying in 3 or 4 c.c. (45 to 60 minims) of 1 per cent. **quinine and urea solution,** and a few minutes after, the author's therapeutic solution, consisting of **normal saline,** 10 c.c. (2½ drams; 10 per cent. **novocaine solution,** 1 c.c. (15 minims); and 1 to 1000 **epinephrin,** 20 drops, is sprayed in. The right bronchus is then similarly treated. Treatment leads to abundant expectoration of thick mucus for some hours or days. Early subjective relief is experienced, and on the day after treatment, or the next, emphysema is found markedly diminished, lung capacity greatly increased, and sibilant râles gone. To obtain permanent relief, the treatment has usually to be repeated once or twice at 5- or 6- day intervals.

W. Freudenthal (Jour. Amer. Med. Assoc., Sept. 21, Part 2, 1912) states that from his experience more than 50 per cent. of cases treated intrabronchially are cured. A relapse may occur, but such cases usually yield quickly to retreatment.

Heilskov and Mahler (Ugeskrift f. Laeger, Dec. 12, 1912) have applied direct local treatment in 30 cases. They used the bronchoscope in all but 2 cases, as this permitted more careful application of the drug by direct oversight of conditions. In none of the 120 applications was there any evidence of toxic injury. A combination of 0.1 Gm. (1½ grains) **novocaine**; 1 Gm. (15 grains) of 1 per 1000 **epinephrin**, and 9 Gm. (2¼ drams) of a 0.9 per cent. solution of **sodium chloride** was generally used, but sometimes **Schleich's solution** was given the preference, or a 3 per cent. solution of **cocaine**, with a little **epinephrin.** In the total of 30 cases the final outcome was a complete cure in 6 cases and marked improvement in 11; in the other 13 no permanent benefit was apparent.

Stephan (Deut. med. Woch., Jan. 27, 1916) states that in Killian's clinic the results from the use of **novocaine-epinephrin solution** sprayed into a bronchus through the bronchoscope have not been as encouraging as those published by others. One patient had no further attacks for 9 months, but they returned; 6 others escaped attacks for periods of 2 to 12 weeks. One patient did not improve at all.

epinephrin solution in, ii. 244
ether in, iv. 692
faradic current in, ii. 244
Fowler's solution in, ii. 243
Guillemin hydraulic apparatus in, ii. 245
high-frequency current in, ii. 243

Asthma (*continued*).
hops (oil) in almond oil in, ii. 245

J. L. Goodale (Boston Med. and Surg. Jour., May 20, 1915) records a case with a high initial sensitization to horse serum, in which 30 injections of progressively increasing doses of serum caused an increase in resistance. This was indicated by failure of the serum to excite hyperemia and itching when applied to the mucous membranes or to a scratch of the skin, although edema could still be produced by hypodermic injection. L. A. Levison (N. Y. Med. Jour., Oct. 30, 1915) treated 3 cases of *horse asthma* by repeated injections of **normal horse serum.** Case 1, a farmer of 32, for 6 years had had attacks of coryza or asthma on going near horses. Five drops of normal horse serum were given subcutaneously. Within 6 hours there was a well marked local reaction which lasted 48 hours. Within 1 hour after the injection he had a feeling of tightness in the chest, but not a typical attack of asthma. Injections were continued every 4 to 6 days, the dose varying from time to time, but in general being increased up to 1.8 c.c. of pure serum. At the end of 4 months the patient was having no asthma and considered himself well. No other treatment was used. Case 2, also a farmer, 34, had had horse asthma for 7 years. He was treated in a similar manner, rather large doses (maximum 2.2 c.c.) being used. The treatment was continued for 18 weeks. Seven months after cessation of treatment patient still had attacks of asthma, on going near horses, but of a very much milder type. Case 3 was a woman of 29, living in a city. She had a rather atypical type of asthma, which was not obviously related to proximity to horses. However, she was found to react to horse serum, and her attacks ceased after a series of immunizing doses.

hydrotherapy in, ii. 243
incandescent-light baths in, ii. 246

Asthma (*continued*).
  intralaryngeal injections in, ii. 245
  intranasal treatment in, ii. 239
  iodine crystals in almond oil in, ii. 245
  laryngotracheobronchoscopy in, vi. 243
  massage in, ii. 244
  menthol in almond oil in, ii. 245
  olive oil in, ii. 242
  oxygen baths in, vii. 275

Hay (Med. World, July, 1916) found phylacogens efficient in bronchial asthma, but not so generally favorable in hay-fever.

  pituitary gland in, ii. 241
  potassium iodide in, ii. 243; vi. 25
  Priessnitz half-bath in, viii. 809
  rectal injections of oil in, ii. 242
  resorcin in, vii. 809
  respiratory gymnastics in, ii. 245
  sandalwood oil in, viii. 70
  senega in, viii. 115
  sodium cacodylate in, ii. 704, 705
  spinal cold douches in, ii. 243
  static electricity in, ii. 243
  strophanthus in, ii. 245
  strychnine in, ii. 242, 243
  sudden application of cold water in, ii. 243
  sulphur waters in, vi. 709
  systematic breathing in, ii. 244
  thyroid gland in, i. 748, 751; ii. 241

Léopold-Lévi (Arch. gén. de méd., Mar., 1912) witnessed good results in 23 cases of asthma from the use of thyroid gland. Many of these were cases of a number of years' standing, and had frequent, intense paroxysms, upon which thyroid preparations exerted an immediate, continued, and very marked inhibitory effect.

The vaccine treatment is not recommended by Pirie (Brit. Med. Jour., June 14, 1913) to the exclusion of other measures, although his results have been good, but simply as an aid where these fail to afford relief. He advises the patient, even when supposed to be cured, to have occasionally a few protective inoculations against any organisms to which he is sensitive, and more especially before the onset of winter.

R. H. Babcock (Lancet-Clinic, Feb. 12, 1916) found that autogenous vaccines benefitted asthma only when an anaerobic fusiform bacillus has been largely present in the vaccine. Great care should be exercised in the use of vaccines that the dosage be not so large or so often given as to cause reaction, since this reaction, whether general or local, indicates a negative phase and aggravates the patient's condition. New vaccines should be prepared whenever the condition of the patient seems to have come to a standstill.

In 2 cases of bronchial asthma treated by vaccines, T. G. Schnabel (Boston Med. and Surg. Jour., May 18, 1916), the first case showed no benefit by the use of a number of autogenous vaccine preparations. The second was relieved of symptoms by the use of only 1 of a number of vaccine preparations. Relief lasted for 3 weeks, when there was a slow return to the former asthmatic attack.

Promising results were obtained by L. Rogers (Pract., June, 1916) in a number of cases of asthma by vaccine treatment. Cultures were made from freshly obtained sputum; subcultures from the fine pneumococcal and streptococcal-like colonies, a number of them being taken up so as to get as many strains as possible in the tubes used for making the vaccine.

About 1 in 6 of the non-sensitive patients treated by I. C. Walker (N. Y. Med. Jour., June 9, 1917) was relieved of asthma for several months by vaccines made from a diphtheroid organism, which was a predominant organism in their sputum. The serum of about 1 in 8 of the non-sensitive patients agglutinated Staphylococcus pyogenes aureus and vaccines of this organism relieved the patient of asthma for several months. Patients who were sensitive to food proteins were relieved of asthma by the omission of these foods from their diet. Those sensitive to bacterial proteins were relieved of asthma by vaccines of those organisms to which they were sensitive. Patients who were sensitive to the proteins in horse dandruff and in cat hair were relieved by subcutaneous injections of these **proteins**; these hair proteins did not desensitize against serum, nor did serum injections desensitize against the hair proteins. When chronic bronchitis was associated with asthma, vaccines were often necessary in conjunction with the protein injections. There seemed to be 2 types of colds and bronchitis. One type is anaphylactic and the other bacterial. The anaphylactic type requires protein treatment and the bacterial type vaccines.

viburnum prunifolium in, ii. 246
X-ray in, ii. 245, 246
zinc oxide in, viii. 836
paroxysm, ii. 232

Jepsen (Ugeskrift f. Laeger, Aug. 20, 1914) has obtained great relief from **acetylsalicylic acid**, as did a number of patients. The dose was 1 Gm. (15 grains). It always helped at once and served to ward off impending attacks. Some of his patients have been thus taking it for 2 years.

adrenal substance in, i. 770; ii. 233, 234, 236
adrenalin in, ii. 233, 234, 236

Staubli (Münch. med. Woch., Jan. 21, 1913) states that the inhalation of 1: 1000 **adrenalin solution** in a special very fine spray from small atomizer arrests a paroxysm at any time. In established severe attacks, the following combination is recommended: **Adrenalin solution** (1: 1000) 9 c.c. (2¼ drams); **atropine sulphate**, 0.01 Gm. (⅙ grain); **cocaine hydrochloride**, 0.025 Gm. (⅜ grain); distilled water, 1 c.c. (16 minims).

The dose of **adrenalin** generally used for asthmatic attacks, according to Hertz (Brit. Med. Jour., May 2, 1914), is much greater than is necessary. The first dose he ever gave himself was 3 minims (0.18 c.c.) of 1: 1000 solution of adrenalin chloride. The relief of the asthma was almost instantaneous, but he felt extremely ill for some minutes, his hands shook so much that he could hardly put the syringe away, and his pulse became very rapid. Since that date he has given himself a large number of injections, but never more than 2 minims (0.12 c.c.), and rarely more than 1 minim (0.06 c.c.); for slight attacks ½ minim (0.03 c.c.) has been sufficient. With these small doses the only effect he ever experienced is relief of the asthma, and this is invariable. In 11 cases of spasmodic asthma and hay fever treated by W. Miller (Lancet, July 18, 1914), the **adrenalin injections** were given once a week, and usually numbered 8 or 10, but in one case 58 were given. The doses were small, varying from 10 minims (0.6 c.c.) of 1: 15,000 to 10 minims of 1: 5000 solution. Considerable variation was observed from this general report, not only in different individuals, but also on different occasions in the same patient. Two patients showed no immediate effect, but in 2 others there were severe symptoms. In 2, the symptoms, circulatory and respiratory, were alarming as a result of intravenous injection. Possibly a condition resembling anaphylaxis develops in some cases.

ammonium carbonate in, i. 617
antipyrin in, ii. 238
apomorphine in, ii. 67
aspirin in, ii. 221, 235
atropine in, ii. 232, 233, 236, 238, 448
atropine-cocaine solution in, ii. 233
belladonna in, ii. 235, 236
belladonna leaves in, ii. 236
belladonna smoke in, ii. 235
Bier's hyperemia in, v. 595
boric acid in, ii. 236
caffeine citrate in, ii. 238; iii. 525
caffeine iodide in, ii. 237
caffeine valerate in, ii. 233
calcium chloride in, ii. 237, 238
chloral hydrate in, ii. 235; iii. 210
chloroform in, ii. 235
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cigarettes in, ii. 235, 236
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convallaria in, iii. 615
creosote in, ii. 236
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epinephrin in, ii. 233, 234, 236
epinephrin inhalant in, ii. 236
ethyl iodide in, ii. 237
eucaine in, ii. 236
eucalyptol in, iv. 706
euphorbia pilulifera in, ii. 238
fuming inhalations in, ii. 235
glonoin in, ii. 239
green-tea leaves in, ii. 236
grindelia robusta in, ii. 238; v. 142, 143
Hoffmann's anodyne in, ii. 235

A. Fraenkel (Therap. Monats., Jan., 1912) gives **heroin hydrochloride** 1/12 to 1/6 grain (0.005 to 0.01 Gm.) hypodermically. The dose should not exceed 1/4 grain (0.015 Gm.).

hyoscine in, ii. 238
hyoscyamine in, ii. 237
hyoscyamus in, v. 579
hyoscyamus leaves in, ii. 236
hyoscyamus smoke in, ii. 235
iodine preparations in, ii. 233
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ipecac in, vi. 58, 59
Laborde's rhythmic traction of the tongue in, ii. 239
lobelia leaves in, ii. 236
lobelia tincture in, ii. 237; vi. 436
Magendie's solution in, ii. 232
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morphine in, ii. 232, 233, 236, 238; vii. 188
morphine bimeconate in, ii. 232
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nitrate vapors in, ii. 236
nitrites in, vii. 55
nitroglycerin in, ii. 238, 239
novaspirin in, ii. 235
opium in, ii. 236; vii. 188
oxygen and adrenalin in, ii. 234
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Combined injections of 0.0008 Gm. (1/80 grain) of adrenalin and 0.04 Gm. (2/3 grain) of **pituitary extract** in 1 c.c. (16 minims) of water used with marked success by Weiss (Deut. med. Woch., Sept. 19, 1912) in arresting paroxysms in 300 cases. It was more effectual than **adrenalin** alone. A second injection was required in only 10 instances.

Warfel (Indianapolis Med. Jour., July, 1915) reports 7 cases of bronchial asthma treated with **pituitary body anterior lobe** on the plea that the paroxysms might be due to deficient adrenal secretion. One 2½-grain (0.16 Gm.) tablet was given 4 times each day. Each case treated showed very marked improvement in the distressing train of symptoms in 48 hours. The duration of this treatment varied from 10 days to 7 weeks, but in no instance did it fail to make the patient comfortable in a short time.

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From a study of the literature and a personal case, Kalashnikoff (N. Y. Med. Jour., from Roussky Vratch, Mar. 10, 1912) draws the following conclusions: 1. When there is a marked intoxication with atoxyl, the peripheral endings of the optic nerve are first affected, followed by degeneration of the entire nerve, which stands in intimate relation with the constriction of the retinal vessels. The clinical picture consists of a gradual decolorization of the papilla of the optic nerve, preceded by a marked concentric narrowing of the visual field, particularly on the inner side, followed by constriction of the retinal arteries, and in some cases complete loss of color perception. 2. Atoxyl is markedly toxic to the visual apparatus, even in moderate doses, particularly when administered for a long time. 3. In view of the toxicity of atoxyl, it is necessary to make a careful study of its physiological effects, and to employ great care in its administration. The eyes should be constantly watched, and with the slightest disturbance of the visual field the administration of the drug should be discontinued.

Although atoxyl had been given very cautiously by Makrocki (Berl. klin. Woch., Nov. 2, 1914), the patient, a woman of 63, became totally blind after taking 0.725 Gm. (11½ grains) of atoxyl divided into 9 doses in less than 2 weeks. R. Steinebach (Berl. klin. Woch., June 15, 1914) observed a case of almost complete blindness from 1.2 Gm. (18 grains) of atoxyl given over a period of 26 days, for a severe anemia. A study of atoxyl amblyopia led the author to conclude that the toxic action of atoxyl, specially severe and lasting visual disturbances, cannot be excluded *even by the cautious therapeutic employment of the drug.* It is especially to be feared when there is latent or obvious disease of the central nervous system, cachexias, autointoxications, chronic infections of the nervous system (lues, etc.), and intoxications, especially chronic alcoholism. These should preclude the use of atoxyl.

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Physiological Action, ii. 435.—As regards its action on the *blood-cells*, Herrick (Arch. of Intern. Med., May 15, 1914) found that atropine in ordinary, non-toxic doses has no striking influence on the eosinophiles of the guinea-pig's blood. In toxic doses there is a diminution in the number of these cells.

The effects on the *nervous system* are often overlooked. Hunziker (Correspond. Blatt f. Schweizer Aerzte; Druggist Circular, Dec., 1916) states that it happens occasionally that because of the attendant delirium a subject is rushed to an asylum. In any suspected case any suspicious beverage or medicine in evidence can be used to test, a drop of this being instilled into a cat's eye. This failing, a drop of the patient's urine may serve the same purpose.

Eggleston (Jour. of Pharm. and Exper. Therap., Oct., 1916) found experimentally that atropine and hyoscyamine were capable of antagonizing the vomiting produced in dogs by some central emetics—pilocarpine and nicotine—and are incapable of antagonizing that of other central emetics —morphine, apomorphine, aconitine, emetine and ouabaine.

I. Simon (Gaz. degli Osped. e della Clin., Jan. 7, 1915) in 13 experiments found that in 3 days from the making of the aqueous solution not only the minimal dose that paralyzes the vagus under other conditions, but much larger doses, fail to paralyze the vagus. The minimal dose per kilogram of weight is not much larger for the rabbit than for man.

McGuigan (Jour. of Pharm. and Exper. Therap., July, 1916) says that atropine in massive doses does not lessen the hyperglycemia due to stimulation of the celiac plexus.

J. D. Pilcher and T. Sollmann (Jour. of Pharm. and Exper. Therap., Mar., 1914) found that the dose of atropine required to produce a full vagus effect is only 2 to 4 times as great as the smallest effective dose. A partial atropine effect can be overcome by increasing the strength of vagus stimulation. The left vagus is less susceptible to stimulation and more susceptible to atropine than the right. Low blood-pressure renders the animals more susceptible to atropine and less so to vagus stimulation.

Higgins and Means (Jour. of Pharm. and Exper. Therap., July, 1915) believe that any *respiratory stimulation* due to atropine is to be explained by (1) the increased "dead space," or dilatation of the bronchi, and (2) increased metabolism. The metabolism being increased, the respiratory volume increases to rid the body of CO_2 produced, and for a unit of CO_2 eliminated, the respiratory volume increases because of an increased "dead space."

In its relations to *immunity* Döblin and Fleischmann (Zeit. f. klin. Med., lxxvii, Nu. 3-4, 1913), in a study of the action of the blood on atropine found that the substance in rabbit serum which annuls the toxic action of atropine is of the nature of a ferment. The reaction was positive in

30 per cent. of 10 patients with exophthalmic goiter and in 15 per cent. of 20 with ordinary goiter; it was never found in the 20 persons with apparently normal thyroids.

Zunz and Tysebaert (Jour. of Pharm. and Exper. Therap., June, 1916) found experimentally that the *stomach and intestine* of the dog isolated half an hour after a hypodermic injection of 1 mg. atropine per kilo only contract weakly and with diminishing strength. The tone falls rapidly. The same is true for the stomach. These effects persist as a general rule for 5 or 6 hours or longer, at any rate in the intestine. The same depressant action may be obtained after 0.1 mg. or 0.005 mg., while after 0.001 mg. the movement is normal though the tone falls rapidly.

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Therapeutics, ii. 444.—Pletneff (Med. Obozrenije, lxxix, No. 3, 1913) studied the action of atropine in 28 cases of *gastric disorders* of various kinds, giving 0.001 Gm. (1/60 grain) hypodermically, once a day during 9 days, and in some cases 2 weeks. He found that it caused a decrease of gastric secretion, and of acidity, reducing pain and spasmodic contraction, the results corresponding with those of Riegel's experiments on animals. By reducing secretory activity it diminished acidity, thus arresting pylorospasm and pain.

Roch and Cottin (Semaine méd., Oct. 30, 1912) holds that while the atropine reaction in cases of *bradycardia* cannot be relied on absolutely, yet it furnishes valuable presumptive evidence, and as it is so harmless and within the reach of every practitioner it deserves wider application. It is invariably positive in the cases of bradycardia of nervous-cerebral origin, and negative with bradycardia from heart-block. The test is merely the hypodermic injection of 0.002 Gm. (1/32 grain) of atropine sulphate and control of the heart-beat afterward. The heart-beat is not modified by the drug in case of actual heart disease, while the pulse is accelerated when the myocardium is sound. The reaction becomes evident in 15 minutes, and reaches its maximum in about an hour.

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Gordinier (Albany Med. Annals, July, 1916) holds that no form of cardiac disorder is more amenable to proper digitalis medication than auricular fibrillation. Its effects or those of its allied drugs are often-times no less than marvelous, patients in immediate peril of death being relieved as if by magic. The deficit between the cardiac impulse and radial artery gradually ceasing, the dyspnea and edema disappear rapidly, the irregularity of rhythm and rapid rate also quickly improving. In the case of fibrillation associated with mitral stenosis the presystolic murmur long since absent often reappears with the improvement of the functioning of the auricles. The drug to be effectual must be used at first in doses sufficiently large to produce definite physiological effects—*i.e.*, distinct lessening of the irregularity and slowing of the pulse-rate, the rate of apex and the radial pulse gradually becoming the same. When their rates reach 70 per minute it is wise to discontinue the drug for a few days, carefully watching the heart-rate in the interval, and if it again becomes rapid, reaching 90 or more, then to give enough digitalis to keep it at about the normal rate, thus continuing the smaller doses over long periods of time, only ceasing when the rate keeps normal and no deficit occurs, or the drug produces some toxic effect, such as vomiting, severe headache, marked sinus irregularity, delayed conductivity, bigemina, or actual heart-block.

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Pathogenesis, ii. 264.—J. G. Adami (Brit. Med. Jour., Jan. 24, 1914) deems it more rational to attribute the evil effects of intestinal stasis to conditions favoring subinfection and low forms of infection than as a result of chronic intoxication. He considers the term "gastro-intestinal autointoxication" as pernicious. While he deems it possible that the symptoms and diseases enumerated by Lane may follow intestinal stasis, he is convinced at least a large proportion of them may originate independently of such stasis. Before recommending the operation of short-circuiting it is necessary, therefore, to make the fullest studies, so as to discover, if possible, the nature of the organism responsible for the disturbance and its probable seat of entry. A discovery of the cause of the symptoms is calculated to suggest methods of treatment other than short-circuiting. Only when these have been tried and found wanting is removal or short-circuiting of the colon justifiable.

Eppinger and Guttmann (Zeit. f. klin. Med., lxxviii, Nu. 5-6, 1913) contend that substances may be sent out from the intestines to act in the capacity of hormones. If this assumption is confirmed, then the intestines must play a rôle in the body similar to that of the glands with an internal secretion.

J. W. Draper and J. M. Lynch (Jour. Amer. Med. Assoc., May 22, 1915) hold that from a *surgical standpoint*, it is necessary to include under autointoxication not alone the lesions caused by substances formed through the vital processes of the organism, which is Coombe's conception, but also those arising from destructive infection of the bowel wall, which in a sense is not true autointoxication, but essentially a surgical disease. Surgeons can at present do no better than to find a means to prevent the absorption of the toxins from a given part of the bowel, however these poisons may have been created. Most acute and chronic purulent colonic infections are surgical from the start, and the future functional efficiency of the organ and of the individual depends on early recognition and proper treatment. Acute streptococcic embolic septic colitis, chronic torpid ulcer, slowly progressive colitis and acute diphtheroid hemorrhagic colitis yield only to surgical therapeusis.

Treatment, ii. 267.—What are the indications for **ileostomy**, what for **colostomy** and what for **resection**? According to the same authors acute purulent hemorrhagic and the acute purulent inflammations of the colon differ in this respect. The first is usually a general infection of the entire colon and rectum, ending in death under ordinary treatment. There is no condition more certain to yield a brilliant result if ileostomy is done in time. Appendicostomy and cecostomy will not cure. They are inadequate, and are contraindicated because unphysiologic. Another rare condition previously treated by irrigation and medication and occasionally by colostomy is multiple polyposis. Ileostomy is the proper therapy. This lesion they believe to be secondary to an infection, and the histologic findings tend to support this view. The causative relationship of infection to polyposis is further supported by the fact that after ileostomy the inflammation subsides and the tumors disappear.

The indications for laparotomy in cases not yielding to colonic vaccines and other suitable forms of medical therapeusis are chronic intractable constipation or diarrhea plus the characteristic mental lesions, together with Roentgen-ray findings and often with slow crepitation over the cecum. Resection is indicated if a non-fused, inflamed, thickened, dilated, infected cecum, often with a mesentery studded with enlarged lymphatic glands, is found. As yet they have not been able to decide positively on resection until after laparotomy. It embodies the resection *en masse* at the terminal ileum, appendix, and cecocolon to the region of the middle colic artery. When completed, it places the ileocolic juncture in the position occupied before birth, which is the adult position in the dog, and may be termed developmental. Of a series of 13 cases, 23.1 per cent. died; 46.2 per cent. were cured; 23.1 per cent. improved, and 7.7 per cent. not improved. Reaction is apt to be severe in proportion to the amount of handling in the neighborhood of the second portion of the duodenum. Reaction, if present, is apt to be delayed until after the fiftieth hour. At least one among their cured cases was unquestionably saved through the administration of **autogenous vaccine**.

The most careful differentiation of all colonic inflammations is necessary, not alone as to character, so far as that be possible, but particularly as to distribution. Some infections are general, others segmental; the therapeusis rests largely on this, an ileostomy being indicated for the one, a colostomy or a developmental reconstruction for the other.

[Our associate editor, Martin B. Tinker, argued that the trend is decidedly against a complete colectomy among the progressive surgeons. Ileosigmoidostomy has been discarded by the progressive surgeons of this country. On the other hand, there are a number of men who have taken up the less radical operations very similar in character to what has been described by Draper. W. J. Mayo recently advocated a very similar procedure and reported some satisfactory results. This less radical procedure has a limited field of usefulness, and most surgeons have seen patients who are not likely to be permanently benefited by it. In many of these cases of colon infection, medical measures have been futile, and very little has been suggested in a surgical way. **Ileostomy** is not difficult and may be tried in these desperate cases. C. E. DE M. S.]

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Soper (Trans. Amer. Med. Assoc.; N. Y. Med. Jour., June 9, 1917) advises that the treatment should be directed against any existing infectious agent, but that reliance should not be placed upon the Bulgarian bacillus as a corrective agent. Cathartics should be avoided. An initial

radical change should be made in the dietary in an attempt to change the bacterial flora. The colonic function must be restored by regulation of diet and physical means, at times by surgical procedure.

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Bacterial vaccines, ii. 272; see also the many diseases in which they are used.

As emphasized by D. J. Davis (Jour. Amer. Med. Assoc., Jan. 20, 1917), the non-specific effect of vaccines is just now probably the most important problem that concerns the vaccinationist. The possibilities of development along this line are many, for the principle concerns an immense number of diseases, both in man and the lower animals.

Writing on the same subject, J. L. Miller (N. Y. Med. Jour., June 16, 1917) states that while clearly defined favorable results had been obtained from the intravenous injection of specific vaccines in typhoid, just as good results had been obtained from non-specific vaccines. Much work has pointed strongly to the occurrence of a non-specific factor as the cause. The same results were secured from the intravenous injection of a large variety of non-specific agents, including bacteria, proteins, peptone, deuteroalbumose, etc. The beneficial results were found to follow in direct relation to the appearance of a transitory acute febrile reaction resulting from the injection. Similar favorable

results were also secured from such injections in a large variety of infective processes, including tuberculosis, arthritis, etc. Still, permanent relief did not usually result in the presence of a focus of infection. The symptoms might be completely relieved in a few hours after an injection, but after a few days they returned as the infecting organisms again multiplied and gained a new foothold. This was well illustrated in cases of gonorrheal arthritis and in acute arthritis complicating infective endocarditis. Many cases of permanent cure, following immediate relief of the acute symptoms, were, however, now on record in cases of acute, subacute, and chronic arthritis in the absence of focal infection. While almost any protein might be used for such treatment, great caution was necessary, especially with the commercial vaccines, which varied widely in their bacterial content, to gauge the dose so as not to cause too extreme a reaction. Although the method seemed to offer great possibilities, it was not free from danger and in the present state of our knowledge it could not be regarded as having reached more than the experimental stage.

As regards the therapeutic value of vaccines, Hektoen (Jour. Amer. Med. Assoc., lxvi, 1591, 1916), after studying with his usual thoroughness the status of vaccine therapy, concludes that the general results so far from the routine use of commercial vaccines, polyvalent and mixed, are valueless as evidence for or against the curative usefulness of vaccine treatment, and hence worthless either with respect to the soundness of the theory on which vaccine treatment primarily has been developed. In subacute and chronic localized infections, the results appear to indicate that specific vaccines properly and skilfully used are useful, quite likely because they increase the production of specific antibodies, as demanded by the theory, but probably also because they stimulate leucocytic and other activities. In typhoid fever and possibly also in other infectious diseases, the intravenous injection of specific vaccines and also of other substances may induce crisis and prompt recovery. The mechanism of this action is not fully understood; but as it involves something more than or different from specific stimulation of the production of antibodies, it cannot be interpreted in terms of the current conception of the action of vaccines.

A warning was expressed by Rövsing (Trans. xi. North Surg. Cong., Göteburg, July, 1916) to the effect that the physician who does not understand the vaccine therapy thoroughly will lose many patients who otherwise could be saved. Naturally the autogenous vaccines are to be preferred. It is not to be expected that the invading organisms will be killed thereby (in bacteriuria vaccine therapy is of no value), but the resistance of the organism to the bacteria is increased.

The use of vaccines in practice is reviewed under heading of each disease in which they have been tried.

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Owing to the toxic symptoms which sometimes occur after taking large doses of bismuth mucilage in *X-ray examinations,* a perfectly harmless substitute for bismuth has been sought. **Barium sulphate** has been warmly recommended for this purpose (Merck's Archives, Aug., 1912); it is insoluble in water and in acids, and trials made on man have demonstrated its harmlessness, as it passes through the stomach and intestines unchanged, and there is no unpleasant action whatever. Only a pure product should be employed, however. It must be absolutely free from soluble salts of barium, the presence of which, even in small quantities, produces toxic effects.

The need of great care is shown by 2 cases of poisoning, 1 of which proved fatal, that occurred in Prague, following the administration of barium sulphate—or what was supposed to be barium sulphate—preliminary to a Roentgen ray examination for diagnostic purposes (Lancet, June 29, 1912). The chemical was ordered from Vienna by the pharmacist to whom the prescription was sent, but in some unexplained way carbonate instead of sulphate was given to the patient, within whose stomach the existing hydrochloric acid rapidly converted the carbonate into the highly poisonous chloride of barium, with disastrous results.

L. L. Jones (Amer. Jour. Roentgenol., iii. 477, 1916), referring to the method of roentgen examination in gastro-intestinal cases as practised at the Battle Creek Sanitarium, states that barium sulphate has given highly satisfactory results in over 8000 cases.

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- Priessnitz, half-, viii. 809
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Bedridden patients, **wet-mit friction** in, viii. 809
Bed-sores, viii. 295

Bed-sores (*continued*).
  baths, prolonged warm, in, viii. 812

If there are complications, or if the necrosis is extensive, nothing can compare, according to Nordmann (Med. Klinik, Nov. 22, 1914), with the **continuous bath treatment.** Not the least of its advantages is that the body floats to a certain extent in the water and thus further pressure on the region is avoided.

  chloral hydrate in, iii. 211
  hydrogen dioxide in, v. 568

Mosny and Pruvost (Soc. Méd. des Hôp. de Paris, May 16; Lancet, June 14, 1913) reported the following case, showing the value of **hot air.** The first douche was given on Oct. 25th with Vignat's apparatus, which was placed at a distance of 20 centimeters and was brought gradually nearer until the air was applied at the highest temperature the patient could bear. The *séance* lasted a quarter of an hour, and already it was then observed that the ulcer had become red. A simple dry dressing was applied. On the 29th the ulcer was in process of cicatrizing; instead of being covered with sloughing débris it was red and granulating. Air douches were given on this day and on the 31st, and on Nov. 2d, 4th, 8th, and 14th. On the latter date the sore had cicatrized; there remained only an ulcer 1½ centimeters in diameter covered with a crust. There was not the slightest suppuration. During the same time the general symptoms had ameliorated. After Nov. 5th there was no more fever. The patient recovered appetite and put on flesh. The phlebitis completely disappeared. This case had resisted all usual methods.

  silver nitrate in, viii. 137
  of spinal cord injuries, see Spinal Cord Injuries, Bed-sores of, viii. 295; also this Index.
  prevention of, **alcohol** in, i. 534
Bednar's aphthæ, vi. 726
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  codliver oil in, vi. 722
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  hydrogen dioxide in, vi. 722
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  potassium chlorate in, vi. 721
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Bee-sting, **adrenalin** in, i. 774; see also Bites, this Index.
Belascaris mystax, see Ascaris Alata, vii. 308
Bell's paralysis, vi. 790
Belladonna, ii. 435
  poisoning (see Atropine Poisoning, this Index), ii. 440

Three cases of belladonna poisoning were observed by Mary E. Joll (Lancet, Oct. 7, 1916) in little children, aged respectively 4, 5 and 6 years, due to eating of the purple berries picked by them from fruiting atropa belladonna shrubs, in a public garden. All 3 recovered under appropriate treatment, **gastric lavage** having brought away the berries.

Benedict's method in urea determination, viii. 673
  test for sugar, iv. 44
Benign tumors, **quinine anesthesia** in, iii. 395
Benzidin (Schumm) test for blood, v. 395
Benzin, see Petroleum, vii. 412
Benzoates, see Benzoin, ii. 453
Benzoic acid, see Benzoin, ii. 453
Benzoin, ii. 453
  poisoning, ii. 455

The test for benzoic acid in urine devised by Raiziss and Dubin (Jour. Amer. Med. Assoc., from Jour of Biol. Chem., Feb., 1915) is a modification of that proposed by Folin and Flanders for ketchup. The procedure is as follows: 100 c.c. of fresh urine are pipetted into a 500 c.c. short-stemmed-separatory funnel, and acidified with 1 c.c. of concentrated nitric acid. Enough ammonium sulphate (50 to 60 Gm.) to saturate the urine is added, and the benzoic acid is extracted with four portions of pure toluene of 50, 40, 30 and 30 c.c. each, respectively. The combined toluene extracts are then washed twice, using 100 c.c. each time, with saturated sodium chloride solution, containing in each liter 0.5 c.c. of concentrated hydrochloric acid. The titration is made with $\frac{N}{10}$ or $\frac{N}{20}$ sodium alcoholate, using phenolphthalein as an indicator. The end point is a definite pink, lasting 2 or 3 minutes.

saline solution enteroclysis in, ii. 455

Benzonaphthol, vi. 786

Benzosulphinidum, see Saccharin, viii. 44

Benzoyl naphthol, vi. 786

Berger's technique in hernia, v. 469, 492

Beriberi, ii. 457; vi. 798

Symptoms, ii. 457.—R. H. Creel (N. Y. Med. Jour., Jan. 25, 1913) asserts that in the United States beriberi has been confined to sporadic outbreaks in various parts of the country during the last 20 years. There is no evidence of any increase, and in this country the disease has not assumed public health proportions.

Where infantile beriberi exists, according to Chamberlain and Vedder (Bull. of Manila Med. Soc., Feb., 1912), the history of the patients treated show that the mothers have all had symptoms of incipient or marked beriberi.

Freire (Brazil Medico, Jan. 8, 1916) relates that Brazil is not the hotbed of beriberi formerly assumed. What has gone by that name in the Amazon region and elsewhere has lately been proved by C. Chagas's official investigation to be a hitherto undescribed form of *quartan malaria*, characterized by a rapid and pernicious course and pretibial edema.

Etiology, ii. 458.—For some years a disease similar to the description of tropical beriberi has been endemic in Newfoundland, according to Gilbert Parker (N. Y. Med. Jour., Aug. 15, 1914). During the last 4 years the number of cases occurring annually has been decidedly on the increase. This disease is confined chiefly to the outposts, and is not solely an affliction of the poorer class. Osler speaks of beriberi among the fishermen on the Grand Banks, but about all the cases here are among the shoremen, that is, men fishing 2 or 3 miles from land in small boats. Little (Jour. Amer. Med. Assoc., June 29, 1912) during 5 years in a wheat-eating country where beriberi is fairly common (Newfoundland and Labrador), found that when from any cause the people have been on a diet of overmilled wheat (ordinary fine white wheat flour), beriberi developed.

J. C. McWalter (Brit. Med. Jour., Feb. 5, 1916) observed a case of relapsing beriberi in a soldier, about 28 years old, contracted in India. His diet was the regulation army fare—meat, vegetables, milk, bread and butter, tea, and occasionally a bit of rice or sago pudding, but at no time in his life was he ever on an exclusive or continuous rice diet. This rather opposes the accepted view that beriberi is due to lack of vitamines produced through the consumption of quantities of polished rice.

M. Findlay (Pract., Jan., 1917) states that the experiments of Frazer and Stanton in Java are almost classical. In these experiments 493 Javanese coolies were employed; of these, 220 were fed on white rice, the remainder on the non-polished variety, with the result that among the former class 20 cases of beriberi developed, while among the latter there were no cases. Instance can be piled upon instance in which the continued consumption of rice deprived of its pericarp and the greater part of its aleurone layer has been followed by beriberi; and per contra, when the deficiency has been supplied, the disease has speedily been cured.

Whether the disease is a purely nutritional one dependent upon the *absence of phosphorus-containing vitamines* in spoiled or *highly polished rice*, or whether it is due to an infection against which the vitamines act as specific antidotes are points which the researches of Vedder and Williams (Philippine Jour. of Sci., June, 1913) do not appear to have satisfactorily solved. One of the proximate principles of this substance has been isolated by Young, and is variously known as Young's basic substance or "beriberi vitamines." The researches of the authors seem to indicate that this basic vitamine has a specific action in preventing the development of the paralytic symptoms of "dry beriberi," whereas another substance in the pericarpal layers of the rice grain is specific against the edema and heart-failure arising in connection with "wet beriberi."

The chemistry of rice polishings was studied by Fraser and Stanton (Lancet, May 15, 1915). They failed, however, to isolate the curative substance which occurs in rice polishings. It is apparently decomposed during the fractionation, and all trace of it is lost. The existence of "vitamine" in the sense that Funk employed that word is therefore disproved.

V. G. Heiser (Med. Rec., Jan. 31, 1914), Director of Health for the Philippine Islands, referring to an outbreak of beriberi at the Culion Leper colony, states that 2 months after the use of polished rice, cases of beriberi began to appear, the maximum number being reached in 3 months. Unpolished rice was begun, and in 3 months the disease had completely disappeared; nor has there been any beriberi since at Culion among government inmates.

Pathology, ii. 461.—Referring to the pathological affinities between beriberi and scurvy, S. T. Darling (Jour. Amer. Med. Assoc., Oct. 10, 1914) states that the striking eccentric hypertrophy and dilatation of the *right heart,* with extensive fatty degeneration of the same musculature (the left heart remaining normal), and the severe degeneration of the *vagus nerve* observed in several fatal cases of scurvy from the Rand, furnish new and additional facts which show the intimate relationship, as to etiology, between the 2 diseases.

The pathologic findings, according to Honda (Mitteil. a. d. kais. Univ., Tokyo, Apr., 1914), are less pronounced in the *peripheral nerves* in acute than in chronic beriberi, but the extent of the nerves involved as a whole is greater than in the latter. The acute form is that in which the nerves of more vital importance, the phrenic and vagus nerves and those of the extremities, are affected early and with great intensity. In the chronic form the less vitally important nerves are affected early and intensely, but those of great vital importance escape entirely or nearly so.

Williams and Crowell (Philippine Jour. of Sci., Mar., 1915) in an experimental study of the *thymus gland* in pigeons and chickens with beriberi, concluded that there was no fundamental connection between this disease and atrophy of the thymus. The latter contains but little vitamine and the benefit claimed for the administration of **thymus gland** in beriberi is probably due largely to purine and pyramidine derivatives.

baths in, ii. 463

C. S. Braddock, Jr. (N. Y. Med. Jour., Apr. 1. 1916) states that some samples of the seed of Phaseolus lunatis, the **golden butter bean** from the west coast of Madagascar, is one of the few beans (a cousin of the lima bean of this country) that will grow in all tropical countries, even in the dry season, and a small quantity of these beans eaten every day, with the usual rice ration of tropical peoples, will absolutely prevent beriberi. As there are at a rough calculation 100,000 deaths yearly from beriberi, the importance of a bean that can be grown in the garden of every coolie is apparent at once. The imported beans in tropical countries are so high in price that the average coolie is cut off from their use as a food.

Beriberi in the Japanese navy was absolutely stopped by a diet of beans. During the Russo-Japanese war the Japanese army reverted to rice only as a ration, and there were 40,000 cases of beriberi in the army.

calomel in, ii. 463
camphorated oil in, ii. 463
coal-tar derivatives in, ii. 463
counterirritants in, ii. 463
diaphoretics in, ii. 463
digitalis in, ii. 463
electric stimulation, ii. 463
enveloping limbs in cotton batting in, ii. 463
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intestinal antiseptics in, ii. 463
kaolin poultice in, ii. 463
liquid diet in, ii. 463
massage in, ii. 463
menthol in, ii. 463
methylene blue in, ii. 463
morphine in, ii. 463
oil of wintergreen in, ii. 463

Pol (Norsk Mag. f. Laeg., Jan., 1916) found that large amounts of a **purée of peas** had an unmistakable curative action on beriberi. As much as 150 Gm. (5 ounces) of the purée 3 times a day was required for this, smaller amounts showing no benefit. **Oatmeal** had a similar influence, but 125 Gm. (4⅙ ounces) 3 times a day were necessary. Europeans did not require quite so much.

potassium acetate in, ii. 463
prolonged warm bath in, ii. 463
quinine in, ii. 463
removal of polished rice from diet in, ii. 463
rest in, ii. 463
rice polishings in, ii. 463

The infantile beriberi which occurs in the Philippines has, according to D. Gregg (Boston Med. and Surg. Jour., May 8, 1913), been successfully treated by the giving of an extract of rice polishings to the nursing mother. Chamberlain and Vedder (Bull. of Manila Med. Soc., Feb., 1912) gave the infants 20 drops of the **extract of rice polishings** every 2 hours while awake, and the results were truly marvelous. Improvement was immediate. The extract is a "cure" in the true sense of the word, just as lime juice is a "cure" for scurvy, and that it acts with as great promptitude as does fruit juice in infantile scorbutus. Five c.c. (1¼ drams) is the dose of extract given daily to the infants treated.

The experience with beriberi among the Philippine scouts reported by W. P. Chamberlain (Jour. Amer. Med. Assoc., Apr. 10, 1915) fully supports the deficiency of vitamines theory. The disease still prevails among the civilian native population, but the military has been practically exempt since treatment has been instituted, based on this theory. The addition of a proportion of **unpolished rice, beans,** etc., to the diet has proved a thorough success.

saline cathartics in, ii. 463
sodium salicylate in, ii. 463
squills in, ii. 463
strophanthus in, ii. 463
strychnine in, ii. 463
unpolished rice in, ii. 463
vapor baths in, ii. 463

The treatment employed successfully by Thompson and Simpson (Annals of Tropical Med. and Parasit., May, 1912) in 3 cases consisted of a full mixed diet, with the addition of **yeast** (1 ounce daily—30 Gm.), recommended by Schaumann, and **katjangidjo beans** (200 Gm. daily—6½ ounces), recommended by Pol. One patient was discharged 16 days after commencement of treatment, walking perfectly, with knee-jerks normal and no pain or edema. This is much more rapid than is customary.

Besom, see Scoparius, viii. 95
Beta-eucaine, see Eucaine, iv. 699
Betaine hydrochloride, see Hydrochloric Acid, v. 549
Betanaphthol, ii. 464

Poisoning.—A case of betanaphthol poisoning during treatment for ankylostomiasis was observed by Orme (Brit. Med. Jour., July 31, 1915), who also warns that in individuals suffering from diseases of the kidneys betanaphthol should be used with utmost caution, if at all resorted to.

- Betanaphthol (*continued*).
  - benzoate, vi. 786
  - di-iodide, vi. 786
  - salicylate, vi. 786
- Betaoxybutyric acid, see Acidosis, this Index.
- Betol, viii. 48
- Betula oil, viii. 46
- Beyea's technique in visceroptosis, v. 783
- Bhang, see Cannabis Indica, iii. 1
- Bier's treatment by hyperemia, v. 580
- Bifid uvula, vii. 436
- Big-nose, see Goundou, v. 75
- Bilateral enteroexclusion, i. 72
- Bile, i. 797

Tatum (Jour. of Biol. Chemistry, Oct., 1916) found bile a powerfully cytolytic agent, owing to the coenzyme or activating action of its constituents on the autolytic enzymes or processes. Whole bile was found more powerful though less penetrating than corresponding concentrations of either of the bile salts.

- Bile ducts, diseases of, vi. 424
  - cancer, vi. 432
    - cholecystenterostomy in, vi. 433
    - cholecystostomy in, vi. 433
    - excision of tumor area in, vi. 433
  - inflammation, see Cholangitis and Cholecystitis, vi. 424; also this Index.
  - lesion of, in abdominal injuries, i. 114
  - obstruction, alkaline waters in, vi. 710
- Bile-passages, obliteration of, i. 97
- Bile-salts, i. 797
- Bilharzia hematobia, vii. 320
- Biliary calculi, see Cholelithiasis, iii. 275; also this Index.
  - cirrhosis, see Cirrhosis of the Liver, iii. 396; also this Index.
  - colic, see Cholelithiasis, iii. 275; also this Index.
  - extracts, i. 797
  - infections, hexamethylenamine in, v. 527
    - lime waters in, vi. 712
  - passages, catarrh of, hydrastis in, iv. 545
    - operations on the, i. 97
    - surgical diseases of, i. 96
- Bilious fever, gelsemium in, v. 18
  - hemoglobinuric fever, calcium chloride in, ii. 719
- Billroth's operation for partial gastrectomy, i. 49
- Birch oil, viii. 46
- Birth injuries, vii. 22
  - -mark, ii. 502
    - cocaine cataphoresis in, iii. 499
  - paralyses, vii. 24
- Biskra boil, see Oriental Sore, vii. 213; also this Index.
- Bismuth, ii. 465

Preparation, ii. 465.—Subgallate of bismuth gauze, according to E. A. R. Newman (Lancet, June 28, 1913) is preferable to iodoform gauze: It is stable and can be sterilized; is odorless, non-toxic; the bismuth has no tendency to dust out; it is equal if not more efficient and cheap.

- poisoning, ii. 466, 470

W. H. Higgins (Jour. Amer. Med. Assoc., Feb. 26, 1916) after an analysis of the literature of poisoning from the injection of *bismuth paste* into the thoracic cavity, states that the indiscriminate use of bismuth, even as a dressing for an external wound, is not devoid of danger, as illustrated by a personal case. A review of the literature showed that up to 1916 there have been 43 reported cases of intoxication, 13 of them fatal, following the local application of bismuth to granulating surfaces. R. Gulden (Münch. med. Woch., Nu. 12, 1912) explains that toxic symptoms are apt to occur in patients whose intestinal canals are pathologically changed. It appears to act in this manner when there are septic and suppurating wounds and epithelial defects in the intestinal tract.

Freilich (Jour. Amer. Med. Assoc., Jan. 13, 1917) reports a case of rather severe bismuth poisoning occurring from the injection of about 45 mils of Beck's paste into a discharging sinus. Irrigation of the sinus with warm olive oil removed the bismuth and patient soon made a good recovery, except that some pigmentation of the gums and tongue persisted.

E. G. Beck (N. Y. Med. Jour., June 17, 1916) states that failures of bismuth paste to cure are due to the following causes: 1. The bismuth is not sufficiently incorporated into the petrolatum, leaving large masses of pure bismuth. 2. Water accidentally gets in and makes a mass like curdled milk. 3. The mixture is not heated sufficiently before injection. 4. Improper instruments are used. 5. Undue force is used; the paste must be forced in very slowly. 6. The sinus is incompletely filled. 7. The sinus is injected too frequently. 8. The patient is allowed to dress his own wounds. Two bacterial examinations should be made, one before and one after injection; if the second is negative, they must not repeat the injection. Finally, the wound should be dressed daily.

aspiration in, ii. 471

olive oil in, ii. 468, 470

Zollinger's (Beitr. z. klin. Chir., Jan., 1912) research concerning *bismuth paste* emphasizes the importance of getting all the bismuth out of the system as rapidly as possible when symptoms from it develop, and **warm olive oil** is recommended for this, especially when the poisoning is from a fistula. The symptoms of bismuth poisoning from external application are cited as fever, headache, nausea, difficulty in swallowing, stomatitis, blue line on the gums, nephritis, convulsions, and tetanus.

warm vaselin in, ii. 471

poisoning in X-ray examination, ii. 470

Lion (Paris méd., June 7, 1913) found that when bismuth subnitrate is given to patients with excessive gastric secretory activity, either an hour before or during a meal, the drug diminishes both hyperchlorhydria and pepsin formation; lowers the intensity of the digestive process in the stomach, and leads to rapid evacuation of this organ into the intestine. A high degree of total acidity still remains, but this is due in large measure to nitric acid set free from the bismuth salt. In X-ray work he disapproves of the use of both the subnitrate and carbonate of bismuth, owing to the danger of bismuth intoxication, and has had prepared an oxide of bismuth which is tasteless, readily emulsifiable, becomes changed to an insoluble oxychloride upon contact with the gastric juice, and is not absorbed into the blood.

Bites, insect-, see Venomous Wounds and Stings, this Index.

alcohol in, i. 534

ammonia in, i. 611, 612

chloral in, iii. 211

erigeron in prevention of, iv. 572

hydrogen dioxide in, iv. 573

magnesium sulphate in, vi. 477

menthol in, vi. 649

naphthalene in, vi. 786

potassium bicarbonate in, vii. 581

leech, **iron subsulphate** in, vi. 89

mosquito, prophylaxis, **eucalyptus lotion** in, vi. 516

phenol lotion in, vi. 516

relief, **chloral** in, iii. 211

ipecac in, vi. 61

snake-, see Venomous Wounds, this Index.

alcohol in, i. 532

ammonia in, i. 612

spider-

Eleven kinds of spiders in tropical America cause more or less poisonous bites, according to Garcia (Semana Medica, Mar. 29, 1917). The symptoms are of 4 types, local necrosis, the icteric, exanthematous and neurotoxic. They are not fatal. Cerrutti in more than 100 cases had no deaths unless pre-existing disease of the heart, liver or kidneys existed.

The poison should be removed by **incisions, cauterization, aspiration** or be destroyed *in situ* if it has not yet been absorbed, by injecting a 1 per cent. solution of **potassium permanganate** into the lesion and around it. Kaufmann uses 1 per cent. **chromic acid**; Halford 10 or 20 drops of a 50 per cent. **solution of ammonia**, injected into a vein, and Calmette, a few cubic centimeters of a 2 per cent. solution of **calcium hypochlorite.** The chlorine gas is liberated; it probably acts at a distance if the poison has been absorbed. The region can be dressed with a 1 per thousand **mercuric chloride** solution or 4 per cent. **boric acid**, or with **potassium permanganate.**

- Bites (*continued*).
  - venomous, see also Venomous Wounds, this Index.
    - coffee infusion in, iii. 516
- Bitter almonds, artificial oil of, see Nitrobenzene, vii. 58.
  - -buttons, see Tansy, viii. 499
- Black death, see Plague, vii. 480
  - draught, see Senna, viii. 116
  - drop, vii. 173
  - eye, alum in, i. 584
  - fever, see Kala-azar, vi. 174
  - pepper, vii. 361
  - sickness, see Kala-azar, vi. 174
  - sweat, see Chromidrosis, viii. 447
- Black-water fever, vi. 532. See also Hemoglobinuria, v. 402, and this Index.
  - quinine in, iii. 379, 380
- Blacktown fever, see Kala-azar, vi. 174
- Bladder, absence of, viii. 718
  - anomalies of, viii. 718
  - atony of, bladder washings in, viii. 722
    - boric acid solution, warm, in, viii. 722
    - catheterization, systematic, in, viii. 721
    - electricity, faradic, in, viii. 722
    - ergot in, viii. 722
    - perineal douche in, viii. 811
    - physostigma in, vii. 460
    - strychnine in, viii. 722
    - turpentine in, viii. 635
  - bleeding from, cotarnine hydrochloride in, iii. 675
  - calculi in, see Vesical Calculi, viii. 724; also this Index.
  - carcinoma of, viii. 733; see also Bladder, Tumors of, this Index.
    - Judd's resection in, vi. 232, 233
  - catarrh of, see Cystitis, iii. 712; also this Index.
  - complications in abdominal surgery, i. 18

I. C. Rubin (Urol. and Cutan. Rev., Sept., 1916) found that out of 10,000 consecutive gynecological cases at the Mt. Sinai Hospital, 875 cases gave bladder symptoms as leading complaint, frequency of urination being the most common. This could be ascribed to diet, weather, etc., but usually originated in a pathological condition. Painful urination, burning, difficulty in starting the urinary stream, complete, partial, or relative incontinence are present alone or associated. Hematuria, concentration, and pain in the hypogastrium were sometimes observed. Correct interpretation of the urinary symptoms required a complete examination.

  - contusions of, i. 128, 136, 139; see also Bladder, Wounds of, this Index.
  - diseases of, viii. 718; also Cystitis, iii. 712; also this Index.
  - diverticulum of.

Diverticulum of the bladder was practically overlooked before the introduction of the cystoscope, owing to the virtual absence of recognizable symptoms during its early stages, assuming those of acute cystitis only when the disorder is well advanced. They are usually attributed to some embryonic defect associated with peculiarities in the closure of the cloaca. Lerche (Annals of Surgery, Feb., 1912) states that both muscular and mucous diverticula may form before and after birth or later in life, the cause being some obstacle to the outflow of urine, such for instance as enlarged prostate.

Symptoms.—If the drainage is good, there may be no symptom. The early characteristic phenomenon otherwise is a tendency to urinate frequently. The catheter may then evacuate considerable retained urine, especially if the diverticulum occupies a dependent position. A large evacuation of pus may follow the formation of a diverticulum from an abscess, the urine then containing more or less pus. Eventually, pain comes on, with fulness or pressure, all located in the abdomen, during or following micturition, and followed by a feeling of incomplete evacuation of the bladder contents. Retention may occur early or late. The infection may be limited to the diverticular cavity, thus causing a *diverticulitis.* The main danger lies in the fact that it frequently extends to the upper urinary tract, causing serious pathological changes.

The urine, owing to the stagnation of the diverticular contents, becomes cloudy and its odor abnormal, ammoniacal, and fetid if it contains mucopurulent material. All symptoms may then become aggravated with perhaps the formation of calculi and other complications. A diverticulitis may exist without cystitis, but clinically the symptoms of the latter appear, with alternating clear, cloudy and purulent urine and sometimes hematuria.

A diverticulitis may become acute (New York Med. Jour., Jan. 29, 1916), recalling by the intensity of the local and general symptoms a perivesical abscess. The inflammatory process rarely leads to gangrene or perforation, but should this take place, the situation becomes critical. As in rupture of the bladder, the prognosis is governed by the absence or presence of adhesions binding the diverticulum to the surrounding viscera. When they exist, the adhesions limit the extent of the infection and prevent it from involving the peritoneum.

Complications.—Infection of the upper urinary tract is favored by compression of the ureter by the pocket, and should the ureter be completely obstructed a pyelonephritis ensues. Another serious infectious complication is a thrombosis of the iliac vessels. Calculi, too, are a common complication when the diverticulum is the seat of infection. In this case the calculi are phosphatic in composition and may reach a considerable size. Uric and oxalic acid stones have also been found. The symptomatology varies greatly and it is only by the cystoscope that we become certain of the true nature of the process. Radiography will also be of help, but may give inexact data as to the number of stones. Intradiverticular neoplasms are rare and are discovered only by the cystoscope. Clinically, the growth gives rise to severe hematuria, which, if intermittent in character, leads to suspicion of a renal origin.

Being thus aware of the great number and variety of complications to which a vesical diverticulum is heir, as well as their ordinarily serious nature, it behooves the surgeon to be on his guard in every case in which a diverticulum has been discovered. Diverticula should not be allowed to remain, as removal of these congenital defects may be accomplished with success, particularly when taken in hand before complications have supervened. When complications have developed the mortality rate has been given as 83.1 per cent.

Diagnosis.—Physical examination often reveals a tumor above the symphysis on either side of the bladder; or if the diverticulum lies behind and below the bladder, a tumor that fills the hollow of the sacrum, causing more or less bulging of the abdomen, if on either side, by raising the intestines. The tumor may sometimes be felt through the rectum or vagina. The catheter or pressure on the tumor sometimes brings a large amount of urine, after normal urination has been resorted to. This excess is the residual urine contained in the diverticulum. As soon as it is removed the tumor tends to disappear, or at least to be greatly reduced.

Where a cystoscopic examination is possible, the orifice of the diverticulum appears as a dark hole of varying size, into which under favorable conditions the cystoscope may be passed and the interior viewed, and the presence of possible stones noted. The picture which presents itself is usually so characteristic that it can hardly be mistaken for anything else. Under certain conditions, however, it may be extremely difficult to distinguish between the mouth of a ureter and the opening of a diverticulum, particularly when the diverticulum opening is of small size. The diverticular orifices are very often near the mouth of the ureters, and the question may arise whether a supernumerary ureter or a diverticular opening is present. Cases have been reported in which the diverticular orifice occupied the normal site of the ureter, the latter discharging directly into the diverticulum.

Radiographs, taken in front and laterally, after filling the bladder with a 5 to 10 per cent. solution of collargol, will disclose the sac.

Pathology.—According to H. Cabot (Boston Med. and Surg. Jour., Mar. 11, 1915) bladder diverticula are covered by the normal coats of the bladder, though the contractility of their muscular fibers is at times certainly defective. The position of election seems to be in the immediate neighborhood of the ureteral openings, on the bladder base, on the sides, and even near the vertex. The effects of bladder diverticula upon the urinary apparatus are largely from (1) those arising from pressure upon the ureter, and (2) from those arising from the inability of the diverticulum to empty itself completely, and therefore its great liability to infection.

Treatment.—Catheterization and irrigation cannot give permanent relief, since the communication of the diverticulum with the bladder seldom permits dependent drainage. **Suprapubic cystotomy** affords temporary relief. For the diverticula which lie on either side of the bladder or which are situated at the vertex, the suprapubic extraperitoneal route should be selected. In cases in which the diverticulum lies below and behind the bladder, the sacral route with temporary resection of the sacrum is the best.

In a personal operation performed with gas-oxygen anesthesia, J. D. Barney (Boston Med. and Surg. Jour., Sept. 30, 1915) opened the bladder **suprapubically** and found an opening on the right side, rather high up, which admitted his forefinger. He packed the cavity tightly with gauze, pushed back the peritoneum and dissected it out entirely extraperitoneally. This was not difficult, except in spots where there were firm adhesions, especially low down against the pelvic wall. Previous to this he tried to find the ureteric orifice on that side, but could not. During the dissection the ureter appeared lying between the diverticulum and the bladder, and he had no trouble with it. It emptied normally into the bladder. Having dissected the diverticulum down to a small neck connecting it with the bladder, he cut this off and closed the opening with a double row of sutures.

Convalescence was uneventful, and the suprapubic wound was closed. The urine was quite clear, but unfortunately the patient can urinate only an ounce or 2, after which 20 or 30 ounces can be withdrawn. This retention seems to be a not unusual occurrence as a result of a diverticulum; probably owing to a lack of tonicity.

The method of removal which W. E. Lower (Jour. Amer. Med. Assoc., Dec. 5, 1914) has found most satisfactory, and which he believes to be applicable in practically all cases, is to convert the sac into a solid tumor by the method described by Cabot in 1912. The bladder having been dissected free from the peritoneum, the diverticulum is packed tightly with gauze, after which, with the fingers inside the bladder—the index finger in the opening of the diverticulum and the thumb on the outside—the attachment to the bladder is exposed and divided. The bladder is then retracted from the diverticulum, traction is made on the tumor, and it is dissected free from the surrounding tissue.

Drainage of the sac, enlarging its opening or curetting or cauterizing its wall accomplish nothing, according to F. Kreissl (N. Y. Med. Jour., Feb. 24, 1917). Better results follow radical surgery of the sac. In all the radical operations (about 20, including 2 personal cases), there have been 3 cases of death, 1 due to sepsis after a transperitoneal operation, and 2 to secondary renal lesions. Of the other cases, some were relieved of all symptoms; others retained the tendency to void in several stages.

Matthey (Revue Méd. de la Suisse Rom., July, 1912) reports a case of vesical diverticulitis, diagnosticated with the cystoscope, in which bladder irrigations with 1 to 2000 oxycyanide of mercury, 1 to 1000 silver nitrate, and later with 3 per cent. boric acid solutions, led to a permanent cure. He advises persistent conservative treatment in these cases before resort is made to radical operation. Wherever possible, a Nélaton catheter of large caliber should be introduced into the diverticulum, which generally opens near the neck of the bladder, and allowed to remain, antiseptic irrigations being practised 3 or 4 times daily until the nature and amount of the residual urine have shown improvement. The catheter should then be removed and irrigations given once or twice daily until the condition is cured or the necessity of operating becomes apparent.

Judd's operation in, vi. 232
double, viii. 718
examination of, viii. 675
exstrophy, viii. 718

Practically all operations are considered under 2 headings by H. Freund (Beitr. z. klin. Chir., xcix, 99, 1916). His personal experience showed that (1) one should not operate on a child under 5 without serious reasons, (2) that from 6 to 8 weeks should elapse between the preparation of the cecum and appendix and the removal of the exstrophied bladder; (3) that ureteral catheterization and analysis of the specimens prior to operation is important; (4) that if pyelonephritis of both sides already exists, operation is not advisable.

autoplastic operations in, viii. 719
cleanliness in, viii. 719
dusting powders in, viii. 719
hot water in, viii. 719
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Bladder, fistula of (*continued*).
hypogastric, catheterization, permanent, in, viii. 736
drainage in, viii. 736
excision in, viii. 736
urethral obstruction to be overcome in, viii. 736
vesicointestinal, catheterization, continuous, in, viii. 736
celiotomy in, viii. 736
colostomy, palliative, in, viii. 736
drainage in, viii. 736
irrigation of bowel and bladder in, viii. 736
rectal tube in, viii. 736
surgical correction in, viii. 736
vesicouterine, correction, radical, in, viii. 736
dissecting out of fistulous tract in, viii. 736
vesicovaginal.

H. A. Kelly (Jour. Amer. Med. Assoc., Jan. 24, 1914) describes an excellent plan of operating in vesical fistulas at the vaginal vault which obviates all difficulties and dangers, simplifies the treatment and gives a maximum certainty of cure. The patient lies in the lithotomy posture, with the posterior vaginal wall well retracted. If necessary a paravaginal incision is made to expose the vault and the fistula. When the operator cuts transversely just above or through the scar tissue and carefully opens the peritoneal cavity, continuing the incision from side to side until it is as big as in a vaginal hysterectomy. This must be done without injuring the bladder or affecting the fistulous tract in any way. A good plan now is to incise the tissues longitudinally through the fistula down to the bladder, which is dissected away from the vagina and sewed up separately, while the vagina is united over the vesical wound, if the operator prefers it at a right angle to it so that the two lines of suturing cross each other. He then usually provides for drainage. In some cases a considerable part of the vesical peritoneum is left in the vagina, forming a new vaginal vault. A mushroom catheter is put into the bladder for a few days to keep it at rest during the first part of the healing process, and the patient remains in bed from 8 to 12 days, the peritoneal drain being removed in from 4 to 6 days.

foreign bodies in the, viii. 723

In the case of an English soldier wounded in France by a shrapnel bullet, described by D. P. Penhallow (Boston Med. and Surg. Jour., Oct. 28, 1915), which had entered in the midline of the back on the level of the lumbar spine, the patient experienced no inconvenience; he merely felt an object rolling about in his bladder, and during urination the stream would be suddenly blocked, and could only be relieved by change of position. An X-ray photograph showed a large bullet free in the viscus. This was removed suprapubically.

G. G. Turner (Lancet, May 6, 1916) also describes 3 cases in the present European war, in which the foreign body had presumably lodged in the bladder at the time of the injury, for in each instance there was some urinary trouble from the outset. In the X-ray investigation of such cases plates should be made with the patient in various positions and with the bladder empty and distended. Marked alteration in the position of the shadow will then be a guide as to the freedom of the foreign body in the viscus. The wound in the bladder closes spontaneously. Small foreign bodies always tend to escape with the urine, but those that cannot pass the urethra may sometimes be safely removed in the eye of an evacuating catheter.

Legueu (Bull. et mém. de la Soc. de chir. de Paris, xli, 2176, 1915), using a specially modified lithotrite, has removed rifle and machine-gun bullets per urethram rapidly and without general anesthesia. For shrapnel bullets, large or ragged fragments of shell, or incrusted foreign bodies, the author considers the suprapubic route the method of choice.

Bladder, foreign bodies in the (*continued*).
  cystoscopy in, viii. 678
  cystotomy, suprapubic, in, viii. 724
  forceps in, viii. 724
  lithotrite in, viii. 724
  removal of, viii. 724
  rest in bed in, viii. 724
functional irritability of, cubeb in, iii. 711
hemorrhage, cotarnine hydrochloride in, iii. 675.
  gelatin in, v. 12
  pancreatic extract in, vii. 299
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inflammation of, see Cystitis, iii. 712; also this Index.
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  hyoscyamus in, v. 578
  lupulin in, vi. 467
  methylene blue in, vi. 686
  pareira in, vii. 330
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  fulguration in, viii. 735
  high-frequency current in, viii. 735
  nephrostomy, bilateral lumbar, in, viii. 735
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  resection, partial, in, viii. 735
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  digitalis in, iv. 157
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resection of, vi. 232
  Judd's technique in, vi. 232
  spinal anesthesia in, viii. 210
rupture of, viii. 722

A. H. Traver (Albany Med. Annals, Nov., 1916) concludes from a study of a personal case (1) that in deciding whether the bladder is ruptured one should not only be able to get back as much fluid as injected into the bladder, but be able to distend the bladder so that it can be felt above the pubis; (2) that a patient can live several days with his peritoneal cavity full of urine; and that the peritoneum has great power to resist the irritating effects of the urine, even in a case like the one reported in which it was not sterile.

extraperitoneal, **catheterization, permanent,** in, viii. 723
  drainage in, viii. 723
  incision in, viii. 723
  irrigations of the bladder in, viii. 723
  suture of opening in, viii. 723
intraperitoneal, **catheter to be retained** in, viii. 723
  drainage, gauze wick, in, viii. 723
  laparotomy in, viii. 723
  rent to be sewn up in, viii. 723
  salt solution in, viii. 723
spasm of the, **cannabis indica** in, iii. 6
  duboisine in, iv. 347
syphilis of.

In reporting a case of syphilis of the bladder, Theodore Baker (Surg., Gynec,, and Obstet., Feb., 1917) states that there is yet but little literature on the subject, most of which is German and French: In America only 3 cases have been reported, Morris, MacGowan, and I. Simons.

The symptoms of the condition present no characteristic features which would at once arouse suspicions. The patient's attention may be attracted to the bladder because of the discomforts usually accompanying an ordinary cystitis; or the first symptom may be a sudden hematuria, which may be unaccompanied by any pain or discomfort whatever, and may continue painless throughout the course of the disease. In the majority of cases there is painful frequent micturition, accompanied at times with terminal hematuria of various degrees. In the tertiary stage hematuria is almost always present; it may be marked from the first, or appear at intervals which become shorter as the attacks increase until there is finally a total hematuria.

One of the striking features of most of the cases reported was the extreme sensitiveness of the bladder to the solutions introduced for cystoscopic examination. In both the secondary and tertiary stages, the pain is more marked the closer the lesion, especially an ulcer, is to the vesical orifice. In 1 case the pain at the neck of the bladder was so intense that no remedy would give relief. Urgency is another symptom which is always marked. Thus, the symptoms are not much unlike those of renal and vesical tuberculosis.

tuberculosis of, viii. 731
  alkalies in, viii. 732
  balsams in, viii. 732
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  calomel emulsion (oily) in, vi. 42
  cauterization in, viii. 733
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  creosote in, viii. 732
  curettement in, viii. 733
  cystoscopy in, viii. 677, 732
  drainage of the bladder, prolonged, in, viii. 733
  feedings, generous, in, viii. 732
  guaiacol solution in, viii. 733
  health to be built up in, viii. 732
  iodine (nascent) in, vi. 54

Farnarier's method of generating iodine fumes by heating iodoform was tried by Baradulin (Russky Vratch, xvi, No. 3, 1917) in 5 cases. The fumes were conveyed into the bladder through a catheter, and 4 of the patients were materially improved. The fifth showed no benefit. There was a powerful reaction to the iodine fumes in all the cases that displayed benefit. Normand has reported improvement in all but 4 of 24 cases thus treated, and Farnarier in all but 1 of his 15 cases.

  iodoform in, viii. 732, 733
  irrigation of the bladder in, viii. 732, 733
  knife in, viii. 733
  mercury bichloride irrigations in, viii. 732
  milk, free use of, in, viii. 732
  potassium iodide in, vi. 42
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  urinary antiseptics in, viii. 732
  water, free use of, in, viii. 732
pain, tenesmus and frequency of urination in, **cystotomy, suprapubic,** in, viii. 733

Bladder; pain, tenesmus and frequency of urination in (*continued*).
    suppositories of opium and belladonna in, viii. 732

A diagnosis, based upon the elimination of other common possibilities, a strongly positive Wassermann reaction tested by a reliable pathologist, and the disappearance of all symptoms and lesions with antisyphilitic treatment, may be rightly accepted.

In 2 cases of syphilis of the bladder reported by Nilson (Jour. Amer. Med. Assoc., from Hygiea, lxxviii, No. 9, 1916) treatment for syphilis cured the bladder trouble completely. In the first case a man of 44 had recurring hematuria for 5 years without any subjective symptoms. The cystoscope then revealed numerous ulcerations in the bladder and cicatricial changes which suggested tertiary syphilis. The man failed to complete the course of treatment advised, and although normal conditions in the bladder were soon restored, he succumbed three years later to aneurism of the aorta.

vesical spasm of, **guaiacol valerianate** in, viii. 732
    mercury bichloride in, viii. 732
    thallin sulphate in, viii. 732
tumors of, viii. 733
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    Bigelow evacuator in, viii. 735
    curette in, viii. 735
    cystoscopy in, viii. 677
    cystotomy, suprapubic, in, viii. 735
    gelatin solution, hot, in, viii. 735

A. A. Uhle and W. H. Mackinney (Penna. Med. Jour., Mar., 1916) state that at the present time it is agreed by all urologists that **high-frequency destruction** is the method of choice in the treatment of benign papilloma, and that it has no value in the treatment of true infiltrating carcinoma. Their experience is in accord with these views. The diagnosis of the type of intravesical neoplasm cannot be made from symptomatology, but must be established by a careful cystoscopic examination, or by the examination of portions of tissue passed or removal by special instruments.

Of 22 personal cases of papilloma, 19 were of the villous type, 3 were semisolid, non-villous and more sessile than pedunculated. In each of 14 patients only 1 tumor was present; 1 patient had 2; and 7 patients had more than 2. Of the 14 patients with 1 tumor each, no particular site of predilection was observed, 3 occurring on the right lateral wall, 7 on the left lateral wall, 1 at the apex and 3 over the ureteral orifices. In 3 patients the site of the multiple tumors predominated at the apex, 2 being recurrences at the place of a previous suprapubic partial resection for papilloma. In 19 cases the diagnosis of benign papilloma was made from the cystoscopic characteristics of the tumor, which was verified by pathological diagnosis in 7. In 3 cases the clinical diagnosis was doubtful, in all of them the pathological diagnosis was papilloma with suspicion of malignant degeneration; these 3 latter tumors responded to **fulguration** treatment and were clinically cured.

With 3 exceptions the monopolar **Oudin current,** generated from a Wappler coil, was employed and found perfectly satisfactory. The illumination was derived from a dry cell battery and the spark from the circuit. Both copper and steel wire electrodes were used; they have no preference. General anesthesia is not necessary, a satisfactory local anesthesia being obtained by the use of **novocaine.** In nervous patients or patients with a highly sensitive urethra, treatment may be facilitated by a hypodermic of morphine administered 1 hour previously.

irrigations in, viii. 735
operation, palliative, in, viii. 735
removal in, viii. 734

Keyes (N. Y. Med. Jour., Sept. 5, 1914) has modified **Rovsing's** treatment to the extent of employing phenol in instillation instead of irrigation, and in solutions of a strength varying in accordance with the sensitiveness of the patient. He begins with a solution of 1 to 200 of water and rapidly increases this to a 1 per cent. before the patient complains of an increase in pain. The half dozen patients on whom he has been able to employ this technic have shown no great benefit until the solution reached a strength of from 2 to 5 per cent.

  silver nitrate solution in, viii. 735
  spinal anesthesia in, viii. 210
  urinary antiseptics in, viii. 735
ulcer of, viii. 735

G. L. Hunner (Surg., Gynec., and Obstet., Apr., 1915) reports 8 cases of simple chronic ulcer of the bladder and draws a sharp contrast between these and the simple chronic ulcer commonly described as of the Fenwick type. These ulcers are classified as simple because of an absence of a demonstrable source of origin and because of the histologic picture of the excised ulcer. They have all been located in the vertex or free portion of the bladder wall, as contrasted with the Fenwick ulcer on the base.

On cystoscopy they are easily overlooked because of the slight mucous membrane changes, and the attention may first be arrested by seeing one or two extra pale white scar areas. Beside the scar area is seen a slightly hyperæmic spot or a collection of a few fine blood-vessels, and on touching this area with an instrument or with a cotton pledget blood readily oozes. At times the stretching of the granulating area incident to the ballooning of the bladder in the knee-breast posture causes a slight ooze and makes the area more easily found. In spite of the very superficial appearance of these ulcers, they at times extend through all the coats of the wall and involve the peritoneum in thickening and adhesions.

Clinically they are characterized by pain, discomfort, frequency, strangury, and loss of rest at night, together with their chronicity and resistance to all ordinary forms of treatment. The urine in all the cases was macroscopically clear and normal, but a microscopic study of the centrifuged specimen revealed in each case a few leucocytes and a few red blood-corpuscles. In no case was there an associated bacteriuria. The ulcer may temporarily heal on the surface when the urine becomes free of pathological elements until the surface is again broken. But one patient of the series had ever noticed blood in the urine, contrasting sharply with the Fenwick ulcer, in which the most important feature is hemorrhage.

The diagnosis of this variety of simple chronic ulcer is fully established only after a failure to heal under ordinary forms of treatment, when excision of the inflammatory area with the entire subtending bladder wall results in prompt recovery.

  antiseptic irrigations of the bladder in, viii. 736
  curettement through operating cystoscope in, viii. 736
  drainage in, viii. 736
  iron in, viii. 736
  urinary antiseptics in, viii. 736
varicose veins of the, viii. 736
  cauterization in, viii. 736
  cystoscopy in, viii. 677
  cystotomy, suprapubic, in, viii. 736
  suture in, viii. 736
wounds of.

Referring to shrapnel wounds of the bladder, Pitzner (Münch. med. Woch., Nov. 10, 1914), reports a case in which the soft parts of the pelvis and one wall of the bladder were penetrated, the shot resting in the bladder without causing any symptoms of bladder disturbance. There were no infiltrations of urine nor symptoms of peritonitis. The bladder was partly filled with urine, which may account for the fact that the shot came to rest there. No urinary symptoms such as burning pain in the penis, or frequency of micturition were present. One of the 2 cases showed inflammatory symptoms, while in the other the urine throughout was perfectly clear. The cystoscope showed shrapnel in the bladder. As soon as the diagnosis had been made, the bullets were removed and the wounds healed by primary union.

V. Saviozzi (Clin. Chir., xxiv, 324, 1916) in reporting 2 cases of gunshot injuries of the bladder treated by suprapubic cystostomy and tamponing of the bladder opening with favorable result, the bladder in 1 containing a bullet as well as some spiculæ from the fractured innominate bone, states that Bartels collected 285 such wounds. It is only very rarely that, as in his case, a bony fragment is carried into the bladder by the projectile. The statistics of 152 cases, collected by Rivington, of intraperitoneal cases there was no recovery, nor was there a recovery in any of the cases reported by Bartels, but extraperitoneal injuries have a more favorable prognosis. The brilliant results obtained authorize him to recommend **cystostomy with tamponade** of the **bladder** because it is rapid, safe, and in serious cases can even be carried out under local anesthesia.

Fullerton (Brit. Med. Jour., Aug. 19, 1916) finds that there are practically only 2 lines of treatment adopted for war injuries of the bladder and urethra at the casualty clearing stations, namely, the tying in of a catheter or suprapubic cystotomy. The latter is not necessary in many cases of wounds of the bladder, provided the latter can be kept clean and the external wound adequately drained. If there is likely to be much sloughing of the bladder walls, if there be severe and continuous primary or secondary hemorrhage, or if there be uncontrollable sepsis of the bladder, **cystotomy** will be advisable. It is performed not so much for the benefit it will have on the original wound, which must be dealt with on ordinary surgical principles, but in order to drain a badly infected bladder and to prevent the spread of infection to the kidneys. If the urethra is so damaged that either the patient is unable to void urine or is likely to have extravasation in attempting to do so, **perineal section** is indicated.

Goldberg (Surg., Gynec., and Obstet., from Zeitsch. f. Urol., ix, 361, 1915) in a study of 3 cases of his own and 11 cases in recent literature, states that the greatest danger to patients with injuries of the bladder comes from the involvement of the peritoneum in the injury. The second great danger is infiltration of urine. Infection can take place after gunshot injuries of the bladder either from the wound or through the urine.

Recent injuries of the bladder and peritoneum should be **operated** on **at once**, but unfortunately this is not always possible. In extraperitoneal injuries of the bladder the chief point is to secure and maintain free discharge of the urine. Generally this is secured by **drainage** through the wound into the bladder and by a retention catheter passed through the urethra into the bladder; if this is not sufficient the bladder should be opened and drained at its most dependent point through the perineum. Bullets or foreign bodies should not be removed until later. **Urinary antiseptics** should be given **internally** from the time of injury, and the **bladder** should be **irrigated with urinary disinfectants.**

Blanching of the hair, see Canities, v. 151; also this Index.

Blastomycosis, dermic, iodine cataphoresis in, vi. 24

E. Jackson (Jour. Amer. Med. Assoc., July 3, 1915) describes 2 cases of *blastomycosis of the eyelid*, a condition which he thinks has been insufficiently noticed. In a case of blastomycosis, clinically and microscopically diagnosed by F. E. Simpson (Jour. Amer. Med. Assoc., Mar. 14, 1914), the lesion was of 3 months' duration and involved both lids of the left eye. A radium varnish applicator, one-quarter strength, containing 0.04 Gm. (⅔ grain) of radium barium salt, was applied for a total of 3 hours in fractional doses during the course of 3 weeks and caused the painless disappearance of the lesion. Two minute points appeared after a few weeks, but disappeared after 15 minutes' exposure to the radium. The healing was accomplished with no tendency to ectropion.

Wade and Bel (Arch. of Internal Med., July, 1916) describe several features which are unusual from the pathologic point of view. In 1 case there were extensive lesions of the spleen and liver, apparently due to the blastomyces, in which very few yeast cells could be found. In a second case there was an apparent secondary invasion by the blastomyces of a pellagrin suffering from pulmonary tuberculosis. In the skin lesion very interesting minute forms were found and specially studied. In a third case the heart was extensively involved, the condition being apparently unique. Widespread secondary bacterial invasion was noted in the liver, brain and bones. In a fourth case there was involvement of the lungs, liver, kidneys and lymph-nodes, cutaneous and subcutaneous. In the fifth case the lungs, ribs, vertebræ and spinal cord were involved with cutaneous and subcutaneous nodules.

A. M. Stober (Arch. of Internal Med., Apr., 1914) in a study of 29 collected cases states that two-thirds occurred under the age of 34 years and all but 2 were in men. In at least 14 cases, the first symptoms were referable to the lungs, suggesting the respiratory tract as the usual route of infection. Pulmonary symptoms occurred sooner or later in all cases. The diagnosis must be based on demonstration of the blastomycetes in the sputum or in the pus of various lesions; the organisms are easily overlooked in stained preparations.

In the treatment, the influence of food, climate, and hygiene is important. **Potassium iodide** in large doses seemed to cure 1 of the 3 patients who recovered. For the cough, pain, and insomnia, **codeine** is especially valuable. **Excision of cutaneous lesions, aspiration** and **drainage** of abscesses give good results. Solutions of **copper sulphate** and **iodine** were found useful for **irrigation** of abscesses. **Vaccination** with a filtrate or suspension of triturated membranes of the organism, grown at room temperature in bouillon for 2 to 6 months, was practised in 2 systemic cases. A von Pirquet test performed with the suspension was found of diagnostic value, a distinct papule, persisting 4 days, being produced.

Blaud's pill, see Iron, vi. 70
Bleeders' disease, see Hemophilia, v. 412; also this Index.
Bleeding, see Hemorrhage, viii. 799, and Venesection, viii. 803; also this Index.
  hemorrhoids, see Hemorrhoids, v. 424; also this Index.
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Considerable stress has been laid by many writers upon the importance of diastolic pressure in addition to the systolic and the pulse-pressure. L. F. Mackenzie (Med. Rec., Dec. 18, 1915) refers to it in fact as the fundamental pressure upon which blood-pressure readings should be based. It is much less influenced by emotions than the systolic; measuring as it does the peripheral resistance, it is the pressure which the heart must first overcome, and which imposes constant strain upon the aorta and aortic valves.

The rôle of emotions is well shown by Dearborn (Med. Record, Sept. 16, 1916), who states that it is only by repeating the measurements each minute (or each 2 minutes) for a half-hour or less, and on several successive days, care being taken in interpretation to avoid all known sources of high pressure, that a correct estimate may be obtained. He found that it raised by tones of unpleasantness, and notably by anxiety; that in some cases, but by no means all, it appears to be lowered by all relaxing and pleasurable sensations; that it is, in general, variable in adults as in children, even during old age; that the deliberate relaxation of the voluntary muscles readily and greatly lowers the pressure.

P. Ménard (Bull. de l'Acad. de méd., Oct. 17, 1916) found in observations made during 8 months in 20 subjects, aged 36 to 40 years, at the front, that explosion of a large shell close at hand caused a distinct rise in the systolic, diastolic, and pulse pressures, which returned to normal within an hour. Fatigue and overwork always lessened the pulse pressure, and nearly always increased the diastolic. Blood-pressure measurements are considered to afford the best criterion of fatigue requiring rest from active duty.

In addition to the above mentioned features Warfield (Illinois Med. Jour., in N. Y. Med. Jour., May 29, 1915), says that the diastolic pressure is more constant for any individual than the systolic pressure. Furthermore, it is probably a more accurate index of high or low tension than the systolic pressure because, as stated, it measures the amount of peripheral resistance. Moreover, it is very necessary accurately to determine the diastolic blood-pressure, because the pulse pressure can thus be obtained by subtracting the diastolic blood-pressure from the systolic. The pulse-pressure, thus determined, represents the actual head of pressure which is forcing the blood to the periphery; the efficiency of the heart action in the face of the existing state of peripheral resistance. A study of these three landmarks in blood-pressure reading gives us desired information concerning the circulation in both the heart and peripheral blood-vessels; the therapeutic importance is plain.

Not only are diagnosis and therapeutics aided by blood-pressure determinations, but the prognostic outlook is also made clearer in many cases. For instance, according to Warfield and others, it is agreed that gradually increasing diastolic pressure is of more significance than high systolic pressure. Although experience has shown that one is not justified in at once presaging a bad outcome in cases with high systolic pressure, it is different with high diastolic pressure. A constant diastolic pressure higher than 110 or 120 is a bad prognostic sign.

The pulse pressure also is of value in estimating the prognosis. In order to bring about compensation in cases of hypertension it is now understood that a large pulse pressure is *sine qua non*. On the other hand, when, in such cases of hypertension, pulse-pressure is decreasing, we may look for a failing heart. Warfield states that any pulse-pressure below 30 mm. Hg. must be regarded as low, while pulse-pressure above 50 mm. Hg. must be considered high. He warns us that attempts at reduction of high systolic pressure without proportionate reduction of the diastolic blood-pressure may be harmful. These suggestions, carried out in actual clinical work, will be found to be of the greatest importance in cases with cardiovascular renal disease.

In a more recent paper, L. M. Warfield (Jour. Amer. Med. Assoc., Feb. 17, 1917) points out that a pulse pressure below 30 mm. is seldom found to continue over a long period of time, being incompatible with the maintenance of a sufficient circulation and that one of 100 mm. Hg or over may occur in persons with good health and considerable bodily and mental vigor.

From the pathological standpoint, as T. C. Janeway observes (Boston Med. and Surg. Jour., Aug. 26, 1915), the work of Fisher, indicating a normal increase of blood-pressure with age, the tendency being to regard 135 mm. as the midlife pressure, and 145 mm. thereafter, has tended to cause us not to view hypertension with so serious a prognostic eye. In the young adult or adolescent, observations carried out by R. I. Lee (Boston Med. and Surg Jour., Oct 7, 1915) on the 662 members of the freshman class of Harvard, showed that at the average age of 18 years, with average height 5 feet 8 inches, and average weight without clothes 143 pounds, the average systolic pressure was approximately 120 mm. Hg. and the average diastolic pressure 80 mm. In the absence of other abnormal findings moderate increase of systolic blood-pressure seemed to be of no significance. The diastolic blood-pressure is much less subject to variation and is of considerable value in offering a control on an abnormal systolic pressure. Albuminuria was present in 5 per cent. of this group, and in only 1 case was there additional evidence of a true nephritis. Albuminuria in young male adults may be permanent, orthostatic, or transitory, and is apparently of no serious significance.

The formula of the normal relation of the systolic, the diastolic, and the pulse pressure, according to Faught (Med. Record, Mar. 10, 1917) is 3:2:1, for example, systolic 124, diastolic 82, pulse pressure 42.

In *children*, estimated by the auditory method which Melvin and Murray (Brit. Med. Jour., Apr. 17, 1915) consider simple and determinate, the average systolic pressure is 108.1, the average diastolic pressure 72.4, and the average pulse-pressure 35.7 mm. mercury. The cardiac output is small in them; besides, the capillary system to be filled is very limited as compared with the adult. Yet the systolic pressure is only slightly lower in children than in adults. The average diastolic level, on the other hand, is decidedly higher in children than in adults; this is the main cause of the considerably smaller pulse-pressure in children—35.7 mm.—as compared with 46 mm. in adults. By the tactile method the average systolic pressure was 105.7 in children as compared with 108.7 in adults, while the range was 125-84 in the former and 132-92 in the latter. By the auditory method the range of systolic pressure was 130-90 in children and 135-92 in adults, while the range of diastolic pressure was 90-50 in the former as compared with 82-50 in the latter. In children the relation of pulse pressure to systolic pressure was 1:3 and to diastolic pressure 1:2, while in adults this relation was 1:2.7 and 1:1.6 respectively.

In the *aged*, 100 women and 50 men examined by Bowes (Jour. of Labor. and Clin. Med., Jan., 1917), the systolic and pulse pressures increased to the age of 85 and then decreased. The diastolic pressure did not vary much after the age of 70. The blood-pressure was higher in women except after the age of 90. There were a few who had very high blood-pressures without symptoms. They were going about their everyday duties in apparently perfect health.

The experimental studies of Brooks and Luckhard (Amer. Jour. of Physiol., Jan., 1915) showed that during *vomiting* there is sometimes a period of elevated pressure, but more frequently a sudden and enormous drop in blood-pressure with cardiac inhibition at the moment of emesis, always periods of great oscillations in the blood-pressure. These great and sudden oscillations of the blood-pressure may cause a rupture of the blood-vessels which would occur with the same pressure but with slower changes.

Diagnosis.—The *diurnal variations* in arterial pressure should be taken into account when clinical readings are taken, at intervals to obtain a correct estimate of the progress of a given case. Thus Weysse and Lutz (Amer. Jour. Physiol., May, 1915) in a study of the diurnal variations in arterial blood-pressure found that a rise of maximum pressure averaging 8 mm. Hg. occurs immediately on the ingestion of food. A gradual fall then takes place until the beginning of the next meal. There is also a slight general rise of the maximum pressure during the day. The average maximum blood-pressure for healthy young men in the neighborhood of 20 years of age is 120 mm. Hg. This pressure obtains commonly one hour after meals. The higher maximum pressures occur immediately after meals, and the lower, as a rule, immediately before meals. The range of maximum pressure varies considerably in different individuals, but the highest and lowest maximum pressures are practically equidistant from the average pressure of any one individual. The minimum blood-pressure is very uniform throughout the day, and is little affected by the ingestion and digestion of meals. When it is affected a rise or a fall may take place. There is a tendency for a slight general lowering of the minimum pressure throughout the day. The average diastolic blood-pressure for healthy young men in the neighborhood of 20 years af age is 85 mm. Hg. Thus the authors get an average pulse pressure of 35 mm. Hg. Pulse-pressure, pulse-rate and the relative velocity of the blood flow are increased immediately on the ingestion of meals. They attain the maximum, as a rule, in half an hour, and then decline slowly until the next meal. There is a general increase in each throughout the day. The average pulse-rate in the authors' investigations proved to be 72 beats per minute.

As to the *significance of variations*, in addition to that mentioned above, Newman and Fischer (Wash. Med. Annals, Sept., 1914) believe that a fall in blood-pressure associated with decreased pulse-pressure is indicative of heart failure; whereas a fall in pressure associated with increased pulse-pressure is indicative of hemorrhage or shock. Slight changes in the systolic and diastolic relation are not to be relied on. Cases should be observed frequently in order that the state of the circulation be understood. The systolic and diastolic blood-pressure should be taken on all surgical cases, before, during and after the operation.

In *infectious diseases,* a high diastolic blood-pressure, according to Schwartmann (Wiener klin. Woch., July 23, 1914), indicates a tendency to paralysis of the larger abdominal vessels with accumulation of the blood in them, and hence this must be accepted as a sign of the severity of the infection. A lower systolic pressure with a lower diastolic pressure is not a sign that the heart is weakening but only that the vascular tonus is growing less. On the other hand, when the diastolic pressure rises while the systolic falls, this is a sign that the heart is weakening.

C. F. Judson and Percival Nicholson (N. Y. Med. Jour., July 4, 1914) made 2300 blood-pressure observations upon *children* whose ages ranged from 1 to 14 years. They consider the auscultatory method superior to the palpation method. The modification of the Erlanger apparatus was found to be the best. The gradual increase in the blood-pressure takes place up to 13 years of age. From 10 to 14 years, at puberty, there is a rapid increase in pressure, owing to the great increase in the size of the heart at that time. The variation from four years to puberty is less than 8 mm. and the total rise from 4 to 14 years of age is 14 mm. They regard the systolic pressure as of more importance than even the diastolic or pulse pressure, although in certain heart lesions the diastolic pressure is extremely important in making the prognosis.

J. H. Musser, Jr. (Arch. of Diag., July, 1914) concludes that diastolic pressures exceeding 110 mm. Hg. are indicative of renal or vascular disease, the latter being practically always accompanied by the former, and probably chiefly responsible for the increase of vascular tension.

According to F. A. Faught (Interstate Med. Jour., Aug., 1914), the studies of Warfield and others have shown the clinical importance of the diastolic test. It can be relied upon to give a correct reading under practically all circumstances, irrespective of the age of the patient, the character of the vessel, or the size of the arm to which the cuff is attached. We fail to obtain the best from our sphygmomanometer if we omit the diastolic observation. Moreover, in many conditions, of the two blood-pressure tests, the diastolic, which can be just as accurately made, is often more valuable than the systolic.

Ferguson (N. Y. Med. Jour., July 24, 1915) recommends a *method of reading the diastolic pressure* as accurately as the systolic pressure. It consists in recognizing as the proper diastolic reading the point at which the first sound is heard on returning from a point just below the fourth phase to that greater height of mercury at which the sounds reappear.

Prognosis.—J. J. Rowan (Jour. Amer. Med. Assoc., Mar. 18, 1916) considers systolic readings as relatively worthless for diagnostic purposes. The most important information is given by the pressure-pulse, or the difference between the systolic and diastolic readings. A falling pressure-pulse is measurable and gives the earliest indication that a patient is not doing well; a rising pressure-pulse points to favorable progress.

W. J. Stone (Amer. Jour. Med. Sci., Feb., 1917) after a study of over 500 patients manifesting various degrees of vascular disease and cardiac disability, found that the types for the most part may be grouped under the following heads:—

1. *The cerebral or cerebrorenal type of hypertension,* which comprised those patients with vascular disease in which there were evidences of damage to the arteries in general and to kidneys in particular. A cerebral death occurred in a large proportion of these patients and the unfavorable prognosis seemed to depend upon the height of the diastolic pressure. In the patients of this group the arteries were rigid as well as contracted.

2. *The cardiac type of hypertension,* which comprised those patients without evidences of vascular disease and its associated nephritis. Death usually occurred from myocardial exhaustion. The arteries were rigid, but not contracted, or the diastolic pressure would have been increased. The prognosis seemed to depend upon the ability of the heart to sustain the increased systolic pressure as a purely compensatory measure.

3. *The cardiac type without hypertension but with increased pressure-ratio.* This group comprised valvular and myocardial lesions which necessitated increased cardiac work. The prognosis seemed to depend upon the ability to sustain an increased pressure-ratio. Death when it occurred was due to myocardial exhaustion.

4. *The cardiac type without hypertension but with decreased pressure-ratio.* This group comprised those patients with cardiac dilatation or those in whom marked evidences of myocardial exhaustion had occurred. The prognosis seemed to depend upon the reaction of the heart to stimulative measures in the endeavor to increase the pressure-ratio.

5. In general, too much reliance should not be placed upon blood-pressure variations as a guide to the condition of the circulation in any particular case, for such variations are of value only when associated with all other data. Certain groups of patients may, however, be differentiated in the manner above outlined, such differentiation possessing definite diagnostic and prognostic value.

L. F. MacKenzie (N. Y. Med. Jour., Sept. 26, 1914), referring to a study of 9000 cases by an insurance company, has shown that the 3 classes of affections especially marked by low blood-pressure were tuberculosis, nervous, and gastrointestinal diseases. In fact, in all the respiratory diseases the blood-pressure was found to be below the normal 126 mm. Hg., and in one instance the presence of an unusually low pressure had led to a careful examination of the patient, the result of which was that a tuberculosis was discovered which would not otherwise have been detected.

Etiology.—In a study of 43 tuberculous patients seen by F. C. Smith (Jour. Amer. Med. Assoc., May 29, 1915) the *effect of altitude* on blood-pressure was not great. A tabulated statement of the result as regards hemoptysis of various degrees failed to support the contention that hemoptysis depended on high systolic pressure. It seems extremely doubtful whether moderate altitude has any pronounced effect on tuberculosis, except possibly in patients whose circulatory apparatus is unable to accommodate itself to the increased strain put on it. P. Schrumpf (Deut. Arch. f. klin. Med., cxiii, 466, 1914) holds that many patients with circulatory troubles are actually benefited by a stay at an elevation of 2000 meters or less. The usual reason against altitude, that the blood-pressure will be raised as the atmospheric pressure becomes less, he regards as fallacious. Normal pressure is unaffected by an ascent to 2000 meters. In a group of 13 patients with slight arteriosclerosis and hypertension, but without serious renal disease, the writer has always found fall in pressure, the decrease amounting to 25 to 55 cm. water. Similar results were obtained in patients with marked arteriosclerosis.

According to V. Bie (Ugeskrift for Laeger, Mar. 4, 1915), various data tend to show that there is no direct connection between the blood-pressure and morbid conditions in the *kidneys,* although abnormal conditions in both are almost invariably found parallel. There is much to sustain the assumption that an abnormally high blood-pressure is the primary disturbance; arteriosclerosis and vascular kidney affections occurring only secondarily. Hypertension is not, however, easily influenced. Moderate hypertension may subside under bed-rest and diet, but a high blood-pressure, 200 to 250 mm., never goes down permanently to normal; 170 mm. seems to be the extreme limit with which this is possible.

In a study of the systolic blood-pressure in pregnancy, based on 5000 consecutive cases, F. C. Irving (Jour. Amer. Med. Assoc., Mar. 25, 1916), found that the lowest systolic pressure recorded was 80, the highest 225 mm. Hg. In four-fifths of the patients it never fell below 100 or rose above 130, which, therefore, may be regarded as the normal limits for such cases. In opposition to prevailing teaching, shock unaccompanied with hemorrhage was not frequent among the cases with abnormally low blood-pressure. Any pressure above the normal high limit was found to be a sign of *toxemia,* it appeared earlier and was more common than albuminuria, and was especially frequent in patients under 30 years. Toxemia was commoner in cold than in warm weather, and much more so in cases with pressures above 150 than in those below. Most cases of eclampsia had pressure above 160, although the condition sometimes occurred with moderate pressure.

W. S. Middleton (Med. Rec., Oct. 16, 1915) observed a proportionate decrease in both systolic and diastolic blood-pressure during the *training* period. With a period of rest succeeding the training period there occurs a rise of systolic and diastolic blood-pressure beyond the anteseason records. The blood-pressure reaction to the given test of 50 stationary running steps is scarcely altered by a period of training. J. H. Barach and W. L. Marks (Arch. of Internal Med., Sept., 1914) found that in 88 per cent. of a series of 629 cases, the *pulse* pressure ranged between 20 and 70 mm. Hg. There was no constant relation between pulse and diastolic pressure, nor between physical efficiency (meaning also circulatory efficiency) and the ratio of pulse pressure to diastolic pressure.

Experiments on cats by F. S. Hammett, E. W. Tice, and E. Larson (Jour. Amer. Med. Assoc., Feb. 24, 1917), in which either heat or cold representing a difference of 25° C. above or below the body temperature was applied either to the outside or to the interior of the abdomen while the blood-pressure of the animal was being constantly recorded. Each application lasted only 15 minutes. When applied externally *cold* produced little or no effect, while *heat* caused a material elevation in the blood-pressure, which was maintained throughout its application. When applied within the abdomen both heat and cold produced a marked fall in the blood-pressure.

The effects of tobacco in cigarette and cigar smoking were found by Thompson and Sheldon (N. Y. State Jour. of Med., Feb., 1917) to correspond. There was an average increase in pulse rate of 13 beats per minute. Whereas the risk from any elevation in blood-pressure increases greatly the higher the initial pressure in the patient, it is undesirable for anyone having a constant systolic pressure much above 200 to smoke. Again, smoking is equally undesirable for anyone having a constant initial pressure above 160 mm. when the use of tobacco is found uniformly to produce a considerable rise in blood-pressure.

A study of the *viscosity of the blood* and blood-pressure by Bucco (Riforma Medica, Mar. 28, 1914) in 19 cases in which the pressure was abnormally high in all but 2, no special connection between the two conditions could be detected except that when the pressure was low the viscosity was generally low also.

Treatment, ii. 496.—According to E. H. Goodman (N. Y. Med. Jour., July 24, 1915), the reduction of blood-pressure by medication should be controlled at every step by the sphygmomanometer. An important fact must not be overlooked, namely, that high blood-pressure is often a necessary accompaniment of altered function and structure, and were it not for this raised blood-pressure, life could not be carried on with these functional or organic changes. Cardiac strength and peripheral resistance are necessary for the maintenance of blood-pressure at a certain level. This is true in health, and is true in disease, with this added feature, that hypertension, if permanent, creates a new physiologic limit, not 130 and not 180, but perhaps 200. One can never say what this physiologic limit is for any given individual. On the other hand, Lichty (Amer. Jour. Med. Sci., May, 1914) urges that a too frequent use of the sphygmomanometer, with a report of the pressure, is bad policy and positively harmful to many anxious patients. A little diplomacy or an evasive answer, with the assurance that it does not matter particularly, is good psychotherapy.

In accord with many modern writers, Brooks (N. Y. Med. Jour., July 25, 1914) regards high blood-pressure pathological, but usually, if not always, physiological in meaning. It tends more to prolong life than to shorten it. Where its causes cannot be removed, it is not to be treated, being compensative.

As regards the remedial measures to be adopted it is obviously necessary to define clearly the form of the blood-pressure present and its pathogenesis.

As regards *hypertension*, an analysis of 305 patients made by Cadbury (Jour. Amer. Med. Assoc., from Arch. of Internal Med., Sept., 1916) showed that about 68 per cent. of those showing hypertension were in patients between 40 and 69 years of age, the greatest number occurring between the ages 50 and 59. Almost three-fourths of the cases, 72.8 per cent., had definite signs of chronic nephritis. Arteriosclerosis was also common. The next most common conditions were circulatory disturbances, chronic myocarditis or valvular lesions. Albumin is usually to be found at some time in cases of hypertension. If it is persistently absent, the cause of the high blood-pressure is generally vascular or cardiac disease, and not renal. In hypertension cases with a normal heart load of 40 to 60 per cent., 85 per cent. had chronic nephritis. Of those cases in which the load was under 40 or over 60 per cent., only about 70 per cent. were cases of nephritis. When the load was under 40 per cent., the prognosis proved to be most unfavorable, but there were several cases without signs of cardiac decompensation. Among those whose heart load was 40 to 60 per cent., only 28 per cent. gave signs of cardiac decompensation; of those whose heart load was 61 to 99 per cent., there were 59 per cent. with cardiac decompensation, and of those whose load was 100 per cent. or more, 66 per cent. showed signs of cardiac decompensation. Hypertrophy of the heart without decompensation was most common in cases with a normal load; when the load was 100 per cent. or over, there were the fewest cases of heart hypertrophy without decompensation and the greater number of decompensated hearts. Subnormal diastolic pressures suggest the presence of aortic regurgitation and the absence of chronic nephritis.

In cardiac decompensation the effect of digitalis was rather to increase pulse pressure and systolic pressure and cause a fall in the diastolic pressure. Deaths in hypertension patients occurred most frequently between the ages of 40 and 60 years, and the underlying condition was either chronic nephritis or chronic disease of the heart, or a combination of the two. More than half the deaths occurred with symptoms of uremia or apoplexy. Twenty-eight per cent. died with signs of progressive heart failure. The patients in more than half the fatal cases had had a systolic pressure of over 200 mm., and 86 per cent. had had diastolic pressure of over 100 mm.

R. W. Baird (Texas State Jour. of Med., Jan., 1917) also concludes, after a study of 125 cases, that high blood-pressure more often indicates cardiac, or circulatory disturbance than renal disease. Early, important symptoms of hypertension are first, in cardiac weakness, dyspnea, etc.; second, in kidney disturbances, polyuria, nocturia. If these early signs be rightly interpreted, we can often put off the serious sequences. The exact height of the blood-pressure (as stated by Janeway) does not seem to have much bearing on the life expectancy.

An experimental study led Hooker (Amer. Jour. of Physiol., Mar., 1916) to conclude that there is a progressive rise in venous pressure practically throughout life.

Extensive experience has led F. de Havilland Hall (Clin. Jour., May 20, 1914) to treat high blood-pressure cases as follows:—

For patients with a pressure of 200 mm. Hg. and upward who have been overworked mentally and physically, treatment should be commenced with a period of **absolute rest.** If there be a pulse of over 100 per minute, or signs of heart failure, rest is imperative, and the recumbent position should be maintained until the pulse-frequency has fallen to normal, and the signs of cardiac weakness have disappeared. But many of the cases of high pressure occur in people who take too little exercise. **Walking** is one of the best forms of exercise to be ordered. **Cycling** may be allowed if taken quietly. **Golf** may be allowed to nearly all patients, except those with advanced arteriosclerosis. The **methods of Schott and Oertel,** if used, should be carried out under the direction of physicians who have had special experience in this line. **Massage** the author has found extremely useful in patients unable to take sufficient exercise, but directions should be given that deep abdominal massage is not desirable, the massage being almost entirely confined to the chest and extremities.

Warm baths, followed by vigorous friction of the skin, are very beneficial. If the patient has been accustomed to Turkish baths, he may continue their use with advantage, but one should hesitate to allow a patient with high pressure to take his first Turkish bath.

In case of *insomnia* the **wet pack** at 70° F. often has a very soothing effect. It answered better than anything else in a patient the author saw, who had a pressure of 250 mm.

The **electric light bath** is very useful in many cases, stimulating the cutaneous vessels and causing sweating; the patients usually experience a sense of well-being afterward.

From the **Nauheim treatment** the author has seen the greatest benefit in suitable cases, but it is a two-edged sword, and is contraindicated in advanced arteriosclerosis, chronic nephritis, and intrathoracic aneurism. It should be carried out only under the observation of a physician with special experience.

A period of starvation benefits some patients, while in some cases it is difficult to induce the patients to take sufficient nourishment. Speaking generally, the most suitable **diet** for arteriosclerotics with high pressure is one mainly composed of **vegetables, farinaceous articles** and **milk,** while substances rich in nitrogen, and especially butcher's meat, should be avoided. In some dyspeptic patients the author has advised ½ pint 250 c.c.) of **soured milk** to be taken 3 times daily, with great benefit. He limits the amount of salt taken as much as possible, and prohibits salted meat and fish.

The author favors distributing the daily amount of food over 4 meals of about equal value, viz., breakfast, luncheon, tea, and dinner. The 2 best meals in the day should be breakfast and luncheon; tea should consist of some bread and butter or plain biscuits with weak tea, or better, cocoa, or milk and water; dinner should be a light meal—a little fish and vegetable with a milk pudding, for instance.

The condition of the gums and teeth needs careful attention, pyorrhea alveolaris being one of the causes of high tension.

Calomel and **blue pill** are useful not only as aperients, but also have a remarkable effect in lowering blood-pressure. A teaspoonful of **Epsom** or **Glauber's salts** may be taken in half a tumblerful of warm water before breakfast, or one of the mineral waters. A tablespoonful of pure **paraffin** taken at night acts pleasantly and efficiently.

Next to the aperients come the **iodides.** Some patients tolerate the **sodium salt** better than that of potassium. If neither seems to suit, **iodoglidine** may be tried. The author orders small doses—3 grains (0.2 Gm.) to be taken 3 times daily for months or even years.

In patients with a *syphilitic* history the Wassermann reaction should be tried, and, if positive, **mercury** administered, preferably by inunction, followed by **potassium iodide** in full doses.

High blood-pressure is often met with at the *menopause,* and is frequently accompanied by obesity; in such cases small doses of **thyroid gland,** together with a combination of **bromide** and **iodide of potassium,** are most useful in diminishing weight, lowering tension, and relieving the patient of the flushes and fulness in the head.

If the iodides are badly borne **potassium or sodium nitrite** in 1- to 2- grain (0.06 to 0.12 Gm.) doses may be tried, though doses up to 5 grains (0.3 Gm.) have been warmly advocated. In solution they are unstable, so are best ordered in chocolate tablets. In a few cases Hall has obtained much benefit from the administration of the **hippurates of ammonium and lithium.** Of the latter, 3 or 4 grains (0.2 to 0.25 Gm.) may be given daily. The ammonium salt is less powerful, and 6 to 7 grains (0.4 to 0.45 Gm.) may be given daily. In *rheumatic subjects* **sodium salicylate** should be ordered.

The more powerful and quickly acting vasodilators, such as **amyl nitrite, nitroglycerine,** and **erythrol tetranitrate,** the author reserves chiefly for *anginal* or *dyspneal attacks* coming on in patients with high blood-pressure. In the very acute attacks inhalation of 3 minims of **nitrite of amyl** will often give immediate relief, and its action may be continued by giving 1/100 grain (0.006 Gm.) of **nitroglycerine.** This dose may be increased up to 1/10 grain (0.006 Gm.). A patient took 10 minims (0.6 c.c.) of the official 1 per cent. solution 3 times a day for some weeks. Eventually it failed to give relief. The author has found **erythrol tetranitrate** in doses of 1/4 grain (0.016 Gm.) most useful in patients who get anginal symptoms on starting to walk. The drug should be given a quarter of an hour previously.

Blood-letting proved of the greatest service in certain cases of high blood-pressure. **Venesection** is indicated where the patient is unconscious and cerebral hemorrhage is feared; likewise in convulsive cases attended with high tension.

The author emphasizes the value of the sphygmomanometer in cases of *coma* as an indication in the employment of **venesection;** by this means one may be able to distinguish between coma due to hemorrhage and that caused by thrombosis, the blood-pressure being invariably low in the latter condition.

D. C. Moriarta (Med. Rec., May 13, 1916) holds that high blood-pressure may be normal for existing morbid conditions and should then not be interfered with, especially by drugs. Bishop's "few **protein**" diet and Kellogg's **vegetable protein** diet are of value, as are also the clearing of the intestinal tract and the production of elimination by **salines** and **alkalies** and **mineral water baths,** while tea, coffee, alcohol and tobacco are best omitted. The **Saratoga waters,** Moriarta believes, exert their greatest benefit from their radium content, their use almost invariably causing a drop of 20 to 60 mm. Hg. in 4 to 6 weeks. **Radium** causes stimulation of normal cells as well as correction of perverted cell action by influence on the enzymes. The writer has treated 56 cases in the past year with radium emanation combined with **radioactive waters** and regulated régime. The radioactive waters are given in doses of 25,000 to 100,000 Mache units a day, in divided doses after meals and at bedtime, while inhalations are given for 2 hours daily in an emanatorium, which shows 250 Mache units to the liter of air. In selected cases radium salts are given intravenously and repeated in 2 weeks.

Ch. Fiessinger (Bull. de l'Acad. de Méd., Apr. 16, 1912), in a comprehensive study of the curable forms of continuous high blood-pressure, considers its 4 commonest causes to be, in the order of their frequency: interstitial nephritis, arteriosclerosis without apparent renal disorder, obesity without renal lesion, and cardiac weakness. Of 160 cases showing a continuous systolic blood-pressure of 230 or 240 mm. Hg. (Pachon instrument), 84 were referable to the first-named cause, 44 to the second, 30 to the third, and 2 to the fourth. The last 3 causes differ from the first in that there may be a prolonged period in which the high blood-pressure remains stationary and even, sometimes, the high pressure may be completely recovered from. In each form of hypertension there may be added, owing to over-exertion, a heavy meal, a long railway journey, etc., a further rise of blood-pressure up to 260, 280 or 300 mm. It is only in such attacks of extra hypertension, according to Fiessinger, that the high-frequency currents are of use, and even here, a recovery may be attained with greater certainty by means of a milk-vegetable diet and rest in bed. In the renal and arteriosclerotic cases it is useless and inadvisable to attempt to lower the blood-pressure permanently, but in the obese, provided the kidneys be not diseased, a considerable fall in the pressure, corresponding with a reduction in the weight, may be secured. After the age of 40, nearly one-half of these obese patients weighing 100 kilogrammes or more show increased blood-pressure; when this is removed and the obesity cured, there is a tendency to rapid development of arteriosclerosis, the pressure then rising again, more especially if the patient's age be 60 or 70. Below this age, recovery is usually complete, though some of the author's cases developed rheumatic pains and sciatica. No marked change in the treatment of obesity is necessitated by the coexistence of hypertension. **Digitalis** is not contraindicated by the high blood-pressure, but it should be given in very small doses, combined with **theobromine.** In the cardiac form of hypertension, in which the pressure is generally only moderately raised, rarely reaching 250 or 270 mm. Hg., **digitalis** is the most promptly acting agent available for lowering it.

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The experience of Elliott (Jour. Amer. Med. Assoc., Sept. 18, 1915) has shown that **digitalis** should be employed early at the very appearance of cardiac decompensation, and continued until thorough compensation has been re-established. If its oral use fails to secure this, it should be employed intravenously. **Strophanthin** in sterile solution by intravenous administration is a highly efficient preparation in the heart failure of high blood-pressure. One-half c.c. (8 minims) of 1 to 1000 solution of strophanthin injected into the elbow vein at appropriate intervals for several doses will often induce cardiac reaction when other measures fail. After the effects become apparent, digitalis may be substituted and the effect continued. Strauss (Therap. Monats., xxix, 10, 1915) states that small doses of **digitalis** are very useful and harmless in arteriosclerosis with high blood-pressure and beginning cardiac insufficiency. He has kept digitalis medication up for years with some of his patients, alternating 2 weeks of these small doses of digitalis with 2 weeks of **iodine.**

erythrol tetranitrate in, ii. 496

In an analysis of 47 cases M. Fontana (Gaz. degli Osped. e della Clin., xxxv, Nos. 50-54, 1914) found that the blood-pressure was constantly reduced when the kidneys were normally permeable, but that they failed in this influence when the kidney functioning was below par. The **high-frequency current** causes slight dilatation of the vessels, and this, in connection with the stimulation of metabolic processes which it induces, causes a throwing off of waste products through the kidneys if they are equal to this task. The result is a marked drop in the blood-pressure. The outcome therefore depends on the permeability of the kidneys.

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A. Eustis (So. Med. Jour., May, 1912) bases on personal records of 300 cases of high arterial blood-pressure, observed since 1905, the following conclusions: High blood-pressure is probably caused by a toxemia, probably from parahydroxylphenylethylamine, which is absorbed from the intestinal canal, where it is formed by the putrefaction of tyrosin. In cases of high blood-pressure elimination is indicated by **catharsis** and copious use of water, *unless the heart muscle is not functioning properly.* A diet composed of substances **yielding** little or no **tyrosin** on digestion is indicated. The **diet** of the patient with high blood-pressure is as important as the medicines prescribed.

C. Quadrone (Riforma Med., Feb. 15, 1913) after finding that **X-rays** applied over the adrenals reduced pathological hypertension, found that the latter did not always coincide with hyperadrenalism, a fact previously shown by the researches of Broeking and Trendelenburg.

[This proves anew the correctness of my own observations (1907) that toxic materials of various kinds, and, particularly among the endogenous group, those classed as intermediate catabolic wastes were often the pathogenic agents in pathological hypertension. C. E. DE M. S.]

Sergent and Cottenot (Bull Méd., Mar. 4, 1914), in 7 cases of what they term "pure hypertension" with renal lesions of vascular sclerosis, obtained from **X-rays** applied over the adrenals considerable reduction of pressure and notable improvement. In 4 cases in which arterial sclerosis and albuminuria were present, the results were less favorable in 3, and of no benefit in 1 case.

hypotension, ii. 496

As regards the meaning of this condition, Cornwall (N. Y. Med. Jour., Mar. 7, 1914) reports 13 cases of low blood-pressure from which he draws the following conclusions: 1. A low systolic pressure, with correspondingly low diastolic pressure, does not necessarily mean poor circulation; it does imply a diminished reserve power of the circulation. 2. A low systolic pressure, with comparatively high diastolic pressure, and therefore a small pulse-pressure, usually means myocardial weakness with chronic nephritis, arteriosclerosis, or arterial spasm, and may be prognostically bad. 3. A low diastolic pressure, with comparatively high systolic pressure, and therefore an excessively large pulse pressure, may mean several things: A purely functional condition, a compensated aortic regurgitation, myocardial degeneration without arteriosclerosis or nephritis, toxemic irritability of the myocardium, or vasomotor dilatation from any cause. 4. The diastolic pressure seems to be more stable than the systolic, and to show less often marked variations from its normal, without definite pathological cause; the systolic pressure seems to accommodate itself to the diastolic more easily than the reverse. The diastolic pressure indicates the peripheral resistance, which in many cases is determined by permanent pathologic conditions. Increase of diastolic pressure beyond normal limits causes pulse-pressure to assume an overload if adequate circulation is kept up. 5. Vasodilator drugs may improve the circulation by increasing the pulse-pressure. 6. Cardiac depressant drugs may lower the diastolic pressure by diminishing the systolic force and calling for a pulse-pressure overload. 7. Acute and chronic toxemias can produce low blood-pressure by dilating the blood-vessels and by weakening the myocardium, but their effect is more often produced by vascular dilatation, either through the vasomotor center or locally. 8. Chronic tobacco poisoning is a very common cause of persistent low blood-pressure.

In the treatment of *hypotension,* Conwell (N. Y. Med. Jour., Mar. 7, 1914) lays stress on removal of cause, if possible, and the importance of rest for patients with chronic myocardial degeneration, especially if there is circulatory insufficiency on slight exertion, when they must be kept very quiet, though many may be allowed to walk around, avoiding stairs and speed; persistent low pressure following typhoid or any acute infection demands prolonged rest in bed. If the circulation is weak, heart stimulants (strychnine, strophanthus, and caffeine) are indicated. Low diastolic pressure with fairly healthy myocardium requires digitalis, but it is contraindicated when myocardial degeneration and relatively high diastolic pressure are present. A severe, sudden fall of diastolic pressure due to toxemic vasomotor dilatation, should be relieved by adrenalin and pituitrin. If due to hemorrhage, the prompt use of normal saline infusions and elevation of extremities is needed.

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F. H. Albee (N. Y. Med. Jour., Jan. 2, 1915), after an experience based on 250 cases, lays stress on Wolff's law, viz., the adaptation in form and strength of a bone-graft to the mechanical requirements. The surgeon can aid nature in bone-grafting by minimizing trauma; by avoiding having the skin incision lie directly over a superficially placed transplant; by excising, if possible, extensive scars from the field of operation; by closely fitting and contracting bone surfaces, including accurate coaptation of periosteum of graft to periosteum of recipient bone, cortex to cortex, endosteum to endosteum, and marrow to marrow; by properly suturing muscle origins and insertions to the proper mechanical locations; and by securing sufficient hemostasis in the graft bed.

The bone contact should be of generous extent, the less healthy the bone, the greater the area of contact. Often early union is aided by interposition of numerous small grafts or fragments of bone. Proper contact of bone elements is secured only by use of the inlay principle. Not only will a graft proliferate and strengthen to an almost unlimited degree, if required, but the bone from which it was removed will return to its original strength. A graft should be used as soon as possible after removal. Sterile petrolatum is a satisfactory preserving medium. The graft should be either immersed in a jar of petrolatum or wrapped in gauze smeared with it and placed in cold storage at 4° to 5° C. Complete dispensing with screws, nails, Lane's plates, wire, etc., for internal bone fixation purposes is rendered possible by making use of bone inlays, wedges, dowels, tongue and groove joints, and mortised and dovetail joints.

C. A. McWilliams (Annals of Surg., lxiii, 185, 1916) directs attention to a case reported by Brewer, who transplanted a radius from a suicide into the arm of a patient operated upon a few days previously for sarcoma of the radius, the lower 2⅜ inches of the latter bone having been removed. The transplant was boiled for an hour and kept in normal salt solution for 4 days. Primary union occurred without subsequent discharge. The case is of interest on account of the extreme rarity of reports of successful homoplastic transplantation.

According to Magnuson (Surg., Gynec. and Obstet., Nov., 1916), it is virtually impossible to cut a long slot on one side of the fracture and a short one on the other, moving the long piece of bone down across the fracture, and using the short piece for the purpose of making bone screws as described by Albee, without freeing the muscles from the bone for a considerable distance on each side of the fracture, producing a great deal of hemorrhage both from the muscle and bone, and lengthening the time of operation and shock thereof. This operation can be done very nicely on the tibia, where the bone lies immediately under the skin and where there is no muscle to contend with. Consequently, favorable reports of this sort of graft in the tibia mean comparatively little.

To correct the defects mechanically and surgically in the bone-grafting operation the following procedure is recommended. The requirements are: (1) To secure an autogenous graft as small as possible to assure firm retention of the fragments; (2) to eliminate the necessity of traumatizing other fields than that of the fractured bone; (3) to shorten the time of operation; and (4) to place the graft in the bone in such a way as to prohibit motion in any direction and hold against any pull exerted on it by the muscles attached to the shaft.

Robert Jones (Brit. Med. Jour., July 1, 1916) points out that after any procedure of bone-grafting it is essential to fix the limb absolutely to let new vessels grow undisturbed by chance movements. All the transplanted bits of bone are to become vascularized. As a general rule, the limb should be kept fixed for at least twice the time necessary for union in simple fracture. It is difficult to give an exact rule as to when bone-grafting should be done, as the danger of recrudescent sepsis seems never absent. The writer waits at least six months after a sinus is closed, during which time efforts are made to improve nutrition of the limb.

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The Mosetig-Moorhof iodoform bone filling method, according to Ashhurst (Annals of Surg., Feb., 1917), is easily applied and most satisfactory in cases of bone cavities which are sterile or nearly so at the time of operation. Thus, in cases of bone cysts or early and localized tuberculous disease, primary healing usually may be expected; and even in cases of bone abscess with attenuated infection, healing usually will occur without further interference, though a sinus may persist for some months.

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H. Ling Taylor (Intern. Abst. of Surg., July, 1915) asserts that a formal fresh air and sunlight treatment, as elaborated at Berck-Sur-Mer near Boulogne, France; Leysin in Switzerland; Sea Breeze at Coney Island, Southampton, N. Y., and elsewhere, has been the most important advance in bone and joint tuberculosis in a generation. Sunlight causes peripheral or local hyperemia and is bactericidal. Exposure of the skin to air is in itself beneficial. Rollier begins by gradually exposing the affected area for 5 minutes and increasing the area and the time until a complete exposure is obtained for several hours. Children under the writer's care have been exposed entirely nude for six hours a day in the summer with the greatest benefit. Burning of the skin by too energetic treatment may be avoided by using talcum powder freely the first week.

W. C. Campbell (Amer. Jour. Orthop. Surg., xiv, 191, 1916) applied heliotherapy in 16 cases of bone and joint affections. Seven were tuberculous, 4 osteomyelitis, 2 pneumococcic arthritis, 1 periarthritis following direct infection of the knee-joint, 1 arthritis deformans, and 1 decubitus. He noticed rapid expulsion of sequestra and a marked and early beneficial effect in severe septic conditions. There is rapid evolution of the tuberculous process, resulting in bony ankylosis in every case. Close attention should be given to **orthopedic measures** for the prevention of the deformity, as in any previous treatment, by using removable apparatus and extension.

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tumors of.

Persistent severe and localized pain in a long bone, according to W. B. Coley (Annals of Surg., Nov., 1914) should lead to suspicion of malignant growth. Early sarcoma rarely involves joints, different from tuberculosis. Exostoses are slower in growth; painless, harder, and more uniform. Myelomata show a globular expansion of a limited portion of bone without deposition of new bone on the outside and without tendency to involvement of the shaft. They usually grow slowly, but occasionally very rapidly, many even metastasizing. The X-ray findings must be carefully interpreted. In periosteal sarcoma there is a tendency to form spicules at right angles to the shaft. In myositis ossificans there is usually a sharply defined periosteal line. In case of doubt, repeated measurements and X-ray examinations at 2-week intervals are of great value. Exploratory incision is permissible in doubtful selected cases, but not as a routine measure.

The pioneer in the local removal of bone sarcomata when the tumor is encapsulated and not of the most malignant character was J. B. Murphy (P. J. Byrne, Pract., Feb., 1917). Local operation gives the patient as good a chance as an amputation in these cases, and if followed by a graft leaves a useful limb. Recurrence, when it takes place, is distal, not local. It is usually possible to get the consent of the patient at an early date for an excision; hence the chances of metastasis are less, while consent for amputation is usually only given as a last resort. A graft is apparently not necessary in removal of the upper part of the fibula.

-wax, Mosetig-Moorhof's, vi. 52, 135

wounds of.

Only small bullet wounds of the diaphyses of long bones, according to L. Plisson (Lyon chir., xii, 635, 1915), can be regarded as non-infected. Any larger wound must be thoroughly opened up, particularly medium sized wounds, as they are more apt to close up and favor development of deep infection.

Treatment.—N. F. Lock (Brit. Jour. of Surg., July, 1916) points out that tunnels and large cavities in bones, due to gunshot wounds or other conditions, are common cause of persistent sinuses. Tunnels occur, for example, where a drainage tube has been passed right through the middle of the bone. The treatment is **subperiosteal resection** of one wall of the tunnel at right angles to the length of the tunnel, so as to convert it into a shallow trough or groove. This trough is drained through the more dependent incision and the soft tissues pressed down into the bone by firm **bandaging**. Large cavities in bone may be similarly treated.

Koerte (Berl. klin. Woch., liii, 1, 1916) points out that **immobilization** is absolutely essential in injuries of the bones and joints in war. At the dressing station there is not time to apply casts, so **splints** must be used,

preferably wooden splints 2 to 3 mm. thick. Of metal splints, Cramer's wire splints are best. At the field hospital a cast should be put on, with openings for dressing the wound. The patient should be given 1/6 to 1/3 grain (0.01 to 0.02 Gm.) **morphine** while the cast is being put on, and if in great pain or for incision and cleansing the wound, light **ether** anesthesia. As soon as the bone is united the plaster should be removed and **exercises** given the joints and muscles. In many cases doing badly under extension application of casts was followed by subsidence of suppuration and rapid consolidation. **Calcium chloride powder and balsam of Peru** aid in the formation of granulations. Very large wounds with much suppuration should be left entirely open, the limb being covered with a wire net with gauze spread over it to keep out the dust. **Bier's hyperemia** is of value in the beginning.

Senechal (Prog. méd., Jan. 27, 1917) found encircling of long bones fractures by projectiles with **wire** to hold the fragments together very effective and fraught with excellent results.

Treatment of bone and joint infections by the **Carrel technique** is recommended by G. W. Hawley (Trans. Amer. Med. Assoc.; N. Y. Med. Jour., June 9, 1917). The fundamental principle is the chemical sterilization of living tissue. Its essential features are: complete exposure of the infected tissue, contact of the sterilizing agent to every part of the wound, and closure of the wound when proved sterile. Excellent results were obtained in 3 cases.

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Boric acid, ii. 577
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Harley (Brit. Med. Jour., Apr. 13, 1913) formerly used boracic acid solutions for lavage of the bowels in cases of colitis, but after having seen symptoms arise in at least 3 patients, decided it might not be such a harmless method as one would be inclined to believe.

P. Wilson (Wash. Med. Annals, Nov., 1915) reports the case of a baby 7 weeks and 6 days old who was given about 3 ounces (90 c.c.) of a saturated solution of boric acid instead of boiled water. It vomited while being nursed, so that this was discontinued, and 3 more ounces of the boric acid solution were given. Copious movements followed, which soon became nothing but clear, jelly-like mucus, and vomiting continued for about 36 hours, gradually decreasing in severity. Two days after the first ingestion there appeared a slight miliary eruption on the neck, chest and back. The disease ran its course rapidly and the peeling was completed in about 10 days. The baby rapidly recovered.

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- gunshot wounds of.

In his 25 cases of *tangential wounds,* from glancing projectiles, Müller (Arch. f. klin. Chir., cvii, Nu. 1, 1915) had only 2 deaths, 1 of the latter having fatal meningitis when the man was brought in. This record was due to prompt and extensive operative intervention in all wounds of the brain. The fear of meningitis should not deter from ample operative measures; every scrap of a projectile or bone splinter should be removed, and where a focus of softening or an abscess has already formed in the brain it should be drained.

As regards *penetrating gunshot wounds* Barany (Wiener klin. Woch., xxviii, 525, 1915) concludes, after studying a number of cases of gunshot injury of the brain, that it is better to **suture at once without drainage.** Although theoretically these wounds are to be regarded as infected, practically they are sterile, and may be sutured.

Jeger (Beitr. z. klin. Chir., xcvii, 418, 1915) agrees fully with Barany's conclusions in regard to the superiority of plastic closure of the dura with fascia in gunshot wounds of the brain. He attributes the good results to the fact that the brain is placed under better physiological conditions when the wound is closed, and so is better able to resist any infection that may have taken place.

Bullets in the brain killed about 50 per cent. on the field during the Franco-Prussian war, 54.2 per cent. in the Russo-Japanese war, 70 per cent. in the Boer campaign, and the proportion was fully as high in the Balkan campaigns. In a series of 43 cases Friedrich (Beitr. z. klin. Chir., xci, Nu. 1 u. 2, 1914) found recovery surprisingly frequent. He does not advocate trephining at once, but only when cerebral symptoms develop under close and not too cursory observation. Any sudden or even a gradual rise in temperature, when the course has been afebrile before, suggests infection of the brain.

All cases of gunshot injury of the brain should, according to Selye and Frey (Wiener klin. Woch., xxviii, 693, 723, 1915), be carried from the front to where they can get hospital treatment as quickly as possible, so that they may be operated upon at once. There is no particular danger of injury from the transportation. On the field a simple occlusion dressing is all that is necessary, and this should not be changed until the patient has arrived at the hospital. Here a thorough operation is performed. After serious brain operations the authors give **urotropine,** 2 to 3 Gm. (30 to 45 grains) per day internally, on account of its effect on the cerebrospinal fluid. When treated in this way the prognosis is very good. Only 8 per cent. of the authors' cases died; but the time since operation is too short to report on permanent results.

In 6 of about 200 brain wounds that have come under his notice, H. F. Wolfenden (Lancet, May 20, 1916), after removal of the foreign body, found cerebrospinal fluid escaping from the depth of the wound, either at the operation or during the dressings some little time after the operation. These patients died from cerebral hernia following infection of the ventricle and basal meningitis. In view of this high mortality he ventured in the 2 cases always to drain the track after the operation for the removal of foreign bodies or depressed skull fragments which were imbedded in the brain. Signs of sepsis being absent or slight, he felt justified in taking the risk of leaving a possibly infected track of the brain undrained to the risk of establishing a cerebrospinal fistula. Fortunately this procedure was justified, and either the wound was not infected or probably the patient's tissues were able to overcome the infection that was there.

Sequelæ.—A study of the *psychic symptoms* after wounds of the brain in 30 cases by Poppelreuter (Münch. med. Woch., Apr. 6, 1915) showed that the capacity for figures may be impaired when there is no actual aphasia. Testing with figures is therefore a delicate test for brain injury. In one shell wound of the left inferior occipital lobe, the man was unable to do any sums in division although no other mental disturbance was apparent. In nearly all the cases of injury of the right hemisphere there was more or less loss of memory. Re-education and training gave very gratifying results.

A study of the *visual disturbances* in gunshot injuries of the brain by Pierre Marie and C. Chatelin (Berl. klin. Woch., Aug. 9, 1915) in a series of 300 cases, showed that over 30 presented lesions of the central optic pathways or the visual cortical centers. Cortical blindness was often followed after weeks or months by a return of distinct vision with, however, extreme contraction of the fields. Surgical intervention is contraindicated in most cases, unless a hemianopsic scotoma is observed to be rapidly enlarging, in which event a brain abscess may be present.

Functional *disturbances of the nervous system* were seen quite frequently, according to J. J. Thomas (Trans. Amer. Neurol. Assoc.; Med. Rec., Aug. 5, 1916), at the base hospitals in France, but most often in the men who had been thrown down by the concussion produced by the bursting of high explosive shells of large caliber or who had been buried in the dirt, as when a trench or dugout had been blown in by such shells.

According to Urstein (Jour. Amer. Med. Assoc., from Russky Vratch, xv, No. 11, 1916), mental disturbance caused by brain injuries develops usually only when more or less extensive portions of the cortex are involved, though it is possible for even circumscribed lesions of the brain as, for instance, fracture of the skull, hemorrhages, etc., to affect the mind. The most frequently observed psychosis was catatonia, next in frequency, psychopathic constitutional anomalies, epileptic insanity and finally manic-depressive states. Urstein has also encountered cases of the so-called exhaustion psychoses, hysterical psychoses and progressive paralysis of the insane. The latter was observed only in soldiers.

Tardy complications were observed by Villaret and Faure-Beaulieu (Bull. et mém. Soc. méd. d. hôp. de Paris, xxxii, 535, 1916) in 27 cases of cranial wounds out of a total of 256 several months after the traumas. They consisted of late epilepsy, grave mental troubles, meningeal infection and abscess of the brain, and late brain hernia. While the latter and mental disorders are exceptional, epilepsy and suppurative meningoencephalitis are common. Meningitis and suppurative encephalitis were noted in 4 cases from 2 to 8 months after the traumas. The persistence of foreign bodies and metallic débris in the lesion proved an important cause. In epilepsy 13 months elapsed before its development, but usually the interval oscillates between 4 and 10 months. The authors conclude that in the case of men trephined or presenting traces of craniocerebral traumas, the future prognosis must be reserved even in the absence of flagrant symptoms of central nervous lesions. Systematic radiologic examination of the cranium should always be made to discover metallic débris or osseous particles; these are foci which provoke late grave results. Such men should not be returned to the front, but kept at duty in the rear under supervision.

Halphen and LeGrand (Paris méd., Apr. 28, 1917) urged, on the basis of considerable military experience, that even in the most severe cases of tear of the dura, with extrusion of brain matter and extensive contusion exhibiting bone splinters, clots, and foreign bodies, recovery should never be despaired of. Something in the way of surgical treatment should always be attempted. Sometimes shaving and cleansing reveals an unexpectedly small bony and dural injury, even though the brain is freely exuding. The aims should be to shut off the cerebral wound from contact with the air and the infected external wound. All loose substances and contused muscle are removed, and likewise freely the deliquescent brain matter until apparently sound nervous tissue is reached. A sufficient myectomy is absolutely essential.

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The treatment of a brain tumor is considered by Baker (Albany Med. Annals, xxxvi, 230, 1915) as one of the most difficult problems before us. Although the mortality seems prohibitive, with Tooth's post-operative mortality of 32 per cent., von Eiselsberg's 38 per cent., and Kuttner's 45 per cent., Cushing has reduced it to 8.4 per cent.; thus the future promises a great improvment. The most frequent form of intracranial neoplasm is the *endothelioma* and is usually easily removed, as it arises from the meninges. The prognosis after successful removal is better than in other tumors, because it does not tend to recur unless the bone has been involved. *Gliomata*, if encapsulated or degenerated, is removable, otherwise decompression alone will probably relieve the symptoms, prolong life, and give comfort as long as a more radical procedure. Cases of *fibrous tumors*, when successfully removed, being benign, are sure of recovery. They are the common tumors of the cerebellopontine recess, arising from the sheaths of the cranial nerves, and the disastrous result is the effect on the respiratory center causing respiratory failure. *Sarcoma* is certain to recur if the brain tissue is invaded; consequently the prognosis depends on the stage at which the tumor is attacked. In *metastatic carcinoma* and *sarcoma* treatment is useless. *Cysts* may be removed or the wall partially removed and drainage established. *Tuberculomata* are usually multiple, found most frequently in the cerebellar region of children, and although often removable their disturbance is usually followed by a fatal tubercular meningitis. *Syphilomata* are usually superficial and easily removed. To obtain a successful operative result, the following requirements are necessary: the surgeon must be thoroughly trained in cerebral surgery and be a master of all the various methods peculiar to this branch of surgery; he must be slow, deliberate, and gentle, and must be assisted by a staff accustomed to his methods; he must have an especially trained anesthetist; and the hospital must be equipped to meet every emergency.

The important factor in successful treatment of brain tumors is early diagnosis and early operation, and the positive indications for operation are increasing *swelling of the optic disc, optic neuritis* with *diminution of visual acuity, unbearable headache*, increasing frequency or severity of *convulsions, extending paralysis*, or pronounced *mental changes*.

Christiansen (Ugeskrift for Laeger, June 8, 1916) states that improvement in the treatment of brain tumors all depends on the general practitioner recognizing in their incipiency the initial symptoms of such a tumor. Though common, yet rare indeed are the cases in which they can be removed in time to avert irreparable injury. In several of his cases the symptoms had seemed to indicate an inoperable tumor, but, when the tumor was exposed it was found that it could be easily shelled out, after which the general and local symptoms promptly subsided. This encourages an attempt at operative measures in the most apparently desperate cases.

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T. McCrae and E. H. Funk (Trans. Amer. Med. Assoc.; Med. Rec., July 1, 1916) reported 5 autopsies which emphasize several points. One of these was that when symptoms and signs pointed to advanced pulmonary tuberculosis, and repeated sputum examinations did not show the tubercle bacilli, the condition was not tuberculosis. Another point which might aid in diagnosis was the disproportion between the signs in the lungs and the constitutional symptoms. Radiographic studies should be made in every case in the hope that in the future this diagnostic aid might be developed.

Chevalier Jackson (N. Y. Med. Jour., Nov. 6, 1915) observed 6 cases in which all the symptoms of bronchiectasis were due to the presence of foreign bodies in the lung. These were opaque to the Röntgen ray, otherwise they would not have been discovered. He uses radiography in every case and, because of the possibility of some foreign bodies not showing in a radiograph, bronchoscopy also.

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McCrae and Funk (Trans. Amer. Med. Assoc.; Med. Rec. July 1, 1916) state that the medical treatment is largely palliative. The adoption of a semi-erect posture facilitates drainage of the apical cases. After **intratracheal inflations** the patient should be placed in the recumbent position. Autogenous vaccines might be tried, although their value was undetermined.

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Lilienthal (Annals of Surg., July, 1916) concludes after treating 26 cases that palliative treatment should be restricted to hopeless cases, extensive unilateral or bilateral involvement, adhesions, etc., that render extirpation impossible. A single focus, or multiple foci in 1 lobe, should be removed surgically. Even when an abscess has extended so as to implicate neighboring lobes in one single infected mass, extirpation may be performed successfully.

J. H. Zaaijer (Neder. Tijdsch. v. Geneeskunde, Feb. 19, 1916) operated on 4 patients who had been given systematic internal treatment for more than a year in vain. All were greatly benefited or clinically cured by the **subperiosteal resection** of from 13 to 20 cm. of 4 or 5 ribs, suturing in 2 tiers with a compressing pad above. One patient was thus completely cured in 5 weeks from a year's disturbances from profusely secreting fetid bronchiectasis. There was some persisting pain in the region for a time, but this gradually wore off. He advises subperiosteal resection first, and only if this proves inadequate, removal of the periosteum and intercostal muscles, supplementing the operative with internal measures as required.

In a report of 5 complete resections of the lower lobe of the lung, with 1 death, S. Robinson (Surg., Gynec. and Obstet., Feb., 1917) concludes as follows: 1. Advanced bronchiectasis cannot be cured by medications, inhalations, intratracheal injections, intratracheal irrigations, climatotherapy or vaccines. 2. Collapse therapy produced either by nitrogen, artificial pneumothorax or by surgical measures is not curative. 3. Pulmonary arterial ligation is of more definite value as a preparation for lobectomy than as a curative

measure *per se.* 4. Excision of the diseased portion of 1 lung is the only curative treatment of advanced bronchiectasis.

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In tracheitis or tracheal bronchitis the bronchoscopic treatment according to R. F. Ridpath (Jour. Amer. Med. Assoc., Jan. 27, 1917), permitting the direct application, on tampons, of glycerite of tannic acid, is ideal in the form with acute inflammation and profuse secretion of mucus, and should be practised every other day. In the form with crust development one should first remove the crusts and then touch the ulcerations with silver nitrate or other silver salt, or with a 10 per cent. alcoholic solution of iodine. Direct application of the ultraviolet ray also promotes absorption of inflammatory exudates and healing.

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hot poultices in, ii. 657
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M. Saenger (Münch. med. Woch., May 5, 1914) states that 20 to 25 drops of the fluid extract of hydrastis canadensis, 3 times a day, is an excellent drug for bronchial catarrh, whether tubercular or not. The sputum is reduced in amount and becomes less viscid and is more readily brought up.

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Ephraim (Deut. med. Woch., Aug. 1, 1912) asserts that adrenalin is invaluable in chronic bronchitis. It is least effective when inhaled; more effective, but only temporarily, when given subcutaneously, most lastingly effective when applied directly to the diseased bronchi.

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Wilcke (Med. Klinik, May 23, 1915) has found arsenic and potassium iodide extremely effectual in chronic bronchitis. He gives 2 drops of Fowler's solution 3 times a day on the first, third and fifth days, alternating it with a 5 per cent. solution of potassium iodide, of which a quarter of a teaspoonful is taken 3 times a day on the second, fourth and sixth days, and so on. Each of the drugs is taken in milk after meals.

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  thiocol in, viii. 528
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  uva ursi in, viii. 763
  vaccine therapy in, ii. 668

R. H. Babcock (N. Y. Med. Jour., Jan. 8, 1916) draws the following conclusions: 1. Autogenous vaccines prepared from the sputa yielded results in 3 cases of acute bronchitis, 1 of chronic bronchitis, and 4 of chronic bronchitis associated with attacks of spasmodic asthma, as to warrant him in recommending this mode of therapy in preference to the old time use of expectorants by mouth. The main drawback is the necessity of several cultures and the preparation of new vaccines, should the cultures show that some of the originally found germs have disappeared or become subordinate in number to others. New vaccines should be prepared whenever the condition of the patient seems to have come to a standstill. Great care is necessary in avoiding too large doses lest a negative reaction occur.

H. A. Cables (Lancet-Clinic, July 22, 1916) calls attention to the efficacy of vaccine treatment. He uses stock vaccines of the Van Cott formula. The first dose given is a large one, to excite the formation of a great amount of antibodies. The interval between doses is always at least 4 days, and is lengthened to a week or 10 days as improvement takes place. **Codeine,** ¼ grain (0.016 Gm.) every 2 hours, is often given to procure temporary relief before the action of the vaccine is brought into play. A typical dose of vaccine contains 50 million streptococci, 100 million each of colon bacilli and pneumococci, and 500 million staphylococci. The improvement following each dose depends upon the severity of the reaction, which is partly local and partly systemic. Great care is taken to eliminate cases of tuberculous infection.

  warm clothing in, ii. 663
  X-rays in, ii. 667, 668
  yerba santa in, ii. 664
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  ammonium carbonate in, ii. 668
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  strychnine in, ii. 668
  thyroid gland in, ii. 668
chronic purulent, ii. 648
dry, ii. 647
febrile, pyramidon in, vii. 719
fetid, turpentine in, viii. 634

In fetid bronchitis, an effective measure, according to A. F. Plicque (Bull. méd., Feb. 7, 1914), is to have the patient inspire, several times a day, air that has been passed through a bottle containing antiseptics such as turpentine water; a mixture in equal parts of **tar, oil of turpentine,** and **peppermint** water; a 1:20 solution of **phenol;** a similar solution with 0.5 per cent. of **eucalyptol** and 0.2 per cent. of **thymol** added, or **menthol crystals.** Barth has advised **inhalation of oxygen.** Spraying in the room the following mixture is another useful measure:—

℞ *Thymolis* .... ʒss (2 Gm.).
Phenolis .... ʒj (4 Gm.).
Alcoholis absoluti. Oij (1 litre).
Aquæ .....q. s. ad ℥iiss (90 Gm.).

M. Sig.: To be sprayed in the sick room.

Subcutaneous injections of the following solution of eucalyptol are also mentioned by the writer:—

℞ *Eucalyptolis* ...... ♏xl (2.5 Gm.).
Olei olivæ sterilisati .....q. s. ad ʒiiss (10 c.c.).
Fiat solutio.

Beverley Robinson (Med. Rec., July 31, 1915) states that of all drugs none is so useful locally as **beechwood creosote** in small doses, not over ½ minim (0.03 c.c.) with a little glycerin and whisky every 2 or 3 hours. The use of beechwood creosote with the perforated zinc inhaler is the best means to correct fetor of the breath and sputum and to modify the diseased bronchial membrane. The inhaler must be worn many hours in the day to be of real utility; the ability to do this comes to many only after the lapse of a few days or weeks. A good formula is equal parts of **beechwood creosote, alcohol,** and **spirit of chloroform,** 2 to 20 drops of which are poured on the sponge of the inhaler and repeated as required.

fibrinous, ii. 673
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  ichthyol in, ii. 675
  lime-water in, ii. 675, 720
  pilocarpine in, vii. 470
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in ether anesthesia, iv. 676
membranous, see Bronchitis, Fibrinous, ii. 673; also this Index.
plastic, see Bronchitis, Fibrinous, ii. 673; also this Index.
purulent, **pyramidon** in, vii. 719
putrid, ii. 648
  hydrogen dioxide in, v. 572
recurrent.

C. G. Kerley (Med. Rec., May 30, 1914) states that in children subject to recurrent bronchitis there is an underlying condition which is common to the difficult feeding cases, eczema, recurrent vomiting, and bilious attacks, and that these children are frequently the offspring of parents who suffer from disturbed metabolism. They frequently bear cow's milk and sugar badly, and exhibit a lessened resistance. It is apt to come on during cold months when the eliminative functions of the body are less active. It has been found that 41 per cent. of the cases of recurrent vomiting suffer from recurrent colds. A diet having an excess of fats and carbohydrates seems responsible for recurrent bronchitis in children. When the carbohydrate content of the diet is cut down in such cases marked improvement usually ensues.

B. R. Rachford (Arch. of Pediat., July, 1914) states that recurrent rhinitis and recurrent sibilant bronchitis, which are sometimes associated with rather severe asthmatic attacks and almost always with a severe paroxysmal cough, are very commonly caused by some kind of food intoxication. They may be in most instances almost or quite relieved by **dietetic treatment.** This symptom group occurs not infrequently in children who have a predisposition to migraine, recurrent vomiting, and urticaria.

Dietetic Treatment of Attack.—During the attack sweets, butter fats, eggs and raw fruits are especially to be avoided. Strawberries, rhubarb, tomatoes, salads, shellfish, tea, coffee, pastry, gravies, cream, codliver oil and alcohol are to be excluded from the diet. If it be necessary to sweeten the cereals and cooked fruits which the child eats, saccharin is to be used instead of sugar, and while the patient is not to have butter, skimmed milk may be allowed. Eggs in every form, even in cooked foods, are to be carefully eliminated from the diet, and among the raw fruits, oranges are to be avoided.

The following foods may be allowed: beef, mutton, fowl, and fish in moderation, cereals, bread, all vegetables not above proscribed, cooked fruits, skimmed milk and thick soups.

Interval Dietetic Treatment.—About 2 months after the patient has recovered from the attack the above diet may be carefully modified by adding 1 egg a day; then, perhaps two weeks later, milk containing 4 per cent. fat may be substituted for skimmed milk. Some few weeks later, all raw fruits, oranges excepted, may be added to the diet. Some weeks later, small quantities of sugar may be used for sweetening cereals and stewed fruits. After 5 or 6 months the child may return to his original diet with the exception that he must eat sparingly of sweets and must eat nothing between meals. If the symptom-group returns on the addition of any article of diet that particular food is to be permanently excluded from the diet.

Hygienic Treatment.—During the attack the patient is to have all the outdoor air he can get with as little exercise as possible; this can be obtained on sleeping porches and with wide-open windows. As he recovers from the attack, exercise in the open air is advisable. School children should have all the air possible at night.

Medical Treatment of the Attack.—During the attack, constipation should be relieved by milk of magnesia or calcined magnesia. Magnesium sulphate may be used in small doses in older children. Alkalies in the form of sodium bicarbonate, potassium bicarbonate, or potassium citrate should be given in fair sized doses 3 or 4 times a day. Sodium bicarbonate, *e.g.*, may be given in 5-grain (0.3 Gm.) capsules 3 or 4 times a day, or the same size dose of potassium citrate may be given in solution. In younger children who object to the taste of sodium bicarbonate, the author commonly directs the mother to distribute through the child's food a teaspoonful of this salt each day. Tincture of belladonna can be given for a short time in 2- to 4- minim (0.12 to 0.25 c.c.) doses 3 times a day.

Interval Medical Treatment.—If constipation cannot be controlled by diet, cascara or other palatable laxative should be used as indicated. The belladonna should be discontinued, but sodium bicarbonate should be given for 6 or 8 weeks, in moderate doses once or twice a day.

The above treatment, if faithfully carried out, will in almost every instance control the syndrome above described. This treatment is almost or quite as effective in the treatment of migraine and recurrent vomiting in children. In the adult and older child, the author uses the following formula:—

℞ *Sodii sulphatis* (dry)	gr. xxx (2 Gm.).
Sodii salicylatis..	gr. x (0.65 Gm.).
Magnesii sulphatis	gr. L (3.3 Gm.).
Lithii benzoatis .	gr. v (0.3 Gm.).
Tinct. nucis vomicæ	gtt. iij
Aquæ destillatæ .	f℥iv (120 c.c.).

The solution is put up in siphons and charged with carbonic acid, and the patient is directed to take, ½ hour before breakfast, a sufficient quantity to produce at least one bowel movement during the morning. This prescription is of great value in the preventive treatment of migraine.

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  cubeb in, iii. 711
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  sanguinaria in, viii. 71
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Bronchoalveolitis, see Bronchopneumonia, ii. 675; also this Index.
Bronchocele, see Goiter, v. 39; also this Index.
Bronchoelectroscope, Brüning's, vi. 244, 245

Broncho-oïdiosis.

As defined by A. Castellani (Jour. of Trop. Med. and Hyg., Apr. 1, 1913), this disease refers to the various types of bronchitis and broncho-alveolitis due to fungi, occurring in the tropics. The symptoms are somewhat similar whatever fungus is the cause. In mild cases there is slight bronchitis with mucopurulent expectoration in which the fungi are found, while in severe cases the patient presents all the symptoms of phthisis with high hectic fever and hemorrhagic expectoration. The infection may take place from man to man and also probably by the fungi living saprophytically in Nature.

The diagnosis is based on the sputum findings. Cultural methods are necessary to identify the fungi. All the species of *Monilia* grow fairly well on gelatin.

Mild cases and those of medium gravity respond quickly to **potassium iodide**, 10 to 20 grains, three times daily. When this salt causes severe iodism, **saiodine** in the same dosage, in cachets, may be given. The **balsamics** and **tonics** are also useful. The diet should be nourishing.

Bronchopneumonia, ii. 675

A method of obtaining a pure bacterial culture in bronchopneumonia was contributed by F. Rosenthal (Paris méd., Apr. 1, 1916). He examines the patient's larynx in the usual way with a rather broad mirror, carefully sterilized, and avoiding all contact of the reflecting surface with the mouth. Previous gargling with dilute hydrogen peroxide solution is perhaps advisable. As soon as the larynx is in view, the patient is requested to cough slightly; often he does so spontaneously. Purulent matter is projected against the mirror, which is then withdrawn and supplies material for making cultures on the ordinary media. Where the patient is weak, the procedure can be used while he is recumbent.

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ammonia (anisated solution) in, ii. 692
ammonia (aromatic spirit) in, ii. 690, 691; viii. 117
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J. Sallès (Lyon Méd., July 12, 1914) collected 55 cases in which an organic foreign body had passed into the air passages. The mortality averaged about 50 per cent. Parents should be warned of the danger of allowing children to play with dry beans or peas, or laugh when eating them. It is safer to mash beans when served to small children. When the foreign body is hard, *e.g.*, a fruit stone, it should be gotten out without delay, though temporizing may be justified with a cooked bean or pea in the absence of signs of bronchitis. Metal foreign bodies are usually better tolerated than the organic, and the X-rays locate them. Turning the child upside down gives slight hope of success and is dangerous unless the foreign body is small, hard and smooth, like a glass bead. With prompt bronchoscopy the mortality has declined from 50 to 13 per cent., and Killian reported in 1913 a mortality of only 8.7 per cent.

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The X-rays are recommended in fresh bubo of venereal character by Kurt Kall (Münch. med. Woch., Oct. 19, 1915) before suppuration has set in. A rapid resorption and cure usually is obtained. He uses one-sixth the thickness of the aluminum filter ordinarily used for deep ray therapy, *i.e.*, only ½ millimeter and ½ the focal skin distance. After 1 application of 10X the bubo becomes much smaller with disappearance of the pain. After 2 to 4 treatments complete resorption occurs.

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In some of the cases seen by R. J. Minnitt (Brit. Med. Jour., Feb. 3, 1917), he noticed the odor of acetone on the breath; the urine was found to be very acid and to contain a large quantity of acetone. After this, in all cases of burns or scalds, in addition to the local treatment, he gave 20 grains (1.3 Gm.) of **sodium bicarbonate** and 1 dram (4 c.c.) of **syrup of glucose** in 1 ounce (30 c.c.) of water every 4 hours, also small quantities of brandy when there was great prostration. The acetone disappeared from the urine in a few days. The mortality-rate greatly diminished.

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A mixture termed **ambrine**, owing to its amber hue, and of which paraffin and resin are the main components, possesses peculiar physical properties which make it available for the treatment of burns. A French surgeon, Barthe de Sanfort (Arch. de méd. et de pharm. Milit., Aug., 1916), reported over 300 burns in soldiers treated with the remedy. The substance is a solid which fuses at about 50° C. and may be sterilized by boiling without injury. It is applied hot (at 70° C.—158° F.), causing no pain whatever, and even after 24 hours is still warmer than the body. The favorable action is due in part to local hyperthermia. Occurring as it does in cakes of paraffin consistency, it is broken up into bits of various size, heated to 125° C. (257° F.) and then cooled to 70° C. (158° F.), the temperature of application.

"Ambrine" being a proprietary the composition of which is not exactly known, J. A. Hull (Brit. Med. Jour., Jan. 13, 1917) states that the results obtained by a mixture of home manufacture in a military hospital have surpassed those obtained by the use of ambrine or any other preparation. He gives the following formula for its preparation:—

℞ *Resorcin*	1	per cent.
Eucalyptus oil	2	"
Olive oil	5	"
Soft paraffin	25	"
Hard paraffin	67	"

The hard paraffin is first melted and the soft paraffin and olive oil are stirred in. The resorcin is next added dissolved in half its weight of absolute alcohol, and finally the eucalyptus oil when the wax has cooled to about 55° C. If necessary, the resorcin may be replaced by a quarter of its weight of betanaphthol. The author adds that the application of this No. 7 paraffin, as it is called, to ulceration following *frost-bite* has been as successful as in the case of burns. Other uses will doubtless suggest themselves for a soft impervious casing to wounds which can yet be readily peeled off without pain or disturbance to the delicate processes of repair.

R. Matas (N. O. Med. and Surg. Jour., Apr., 1917) describes 2 substitutes for ambrine. One, known as **No. 7 paraffin,** has given better results than ambrine even in severe third degree burns accompanied by sloughing and very septic, and extensive burns of the flexor surfaces and face. One is the formula given above. But owing to the difficulty of obtaining resorcin in large quantities betanaphthol has been substituted recently in the following preparation:—

℞ *Betanaphthol*	0.25	per cent.
Eucalyptus	2	"
Olive oil	5	"
Paraffin, soft	25	"
Paraffin, hard	67.75	"

W. G. Hudson (N. Y. Med. Jour., Feb. 17, 1917) states that the application of **ambrine** is not painful if kept under 70° C. Redressings are easy, rapid, and not painful. He uses a special atomizer for its application. A surgically clean area is first insured by wet dressings of Dakin's solution for a day or two. Otherwise the secretions locked beneath the dressings are already foul and offensive at the end of 24 hours, and while saprophytic bacteria may not delay the process of repair, we may easily lock up and incubate other kinds under the paraffin coating. Properly prepared **Dakin's solution** does not cause pain, but actually seems to give great relief in burn cases. The formula used was that given by Lloyd Noland (So. Med. Jour., Dec., 1916), but the formula of the solution will be found on page 193 and that of the improved Dakin-Carrel solution on page 815 of the eighth volume. The preparation of the fluid requires skill and great care.

amyloform in, i. 623
aristol in, ii. 118; viii. 174, 175
bandages in, viii. 175
benzin in, vii. 413
bismuth subnitrate in, ii. 473; viii. 174
boric acid in, viii. 174
carbolic acid in, viii. 174
carbolic acid and **alcohol** in, i. 567
calcis (linimentum) in, vi. 365
carron oil in, ii. 720; vii. 443
chloretone in, iii. 219
citric acid in, viii. 174
cold in, viii. 174
collodion in, iii. 536
creosote in, iii. 689
diaphtherin in, vii. 446
Esbach's solution in, viii. 175
ethyl aminobenzoate in, iv. 693
eudoxin in, iv. 706
europhen in, iv. 709; viii. 174, 175
exalgin in, iv. 711
guaiacol in, v. 148

Burns, local treatment (*continued*).
  hamamelis in, v. 161
  heat in, viii. 174
  ichthyol in, v. 638; viii. 174
  iodoform in, viii. 175
  iodol in, viii. 174, 175
  laudanum in, viii. 174
  lead carbonate paint in, vi. 313; viii. 174
  lead-water in, viii. 174
  limitation of deformity in, viii. 175
  lysol in, viii. 503
  magnesia, calcined, in, viii. 175
  massage in, viii. 175
  mercury bichloride in, viii. 174
  olive oil in, vii. 171
  orthoform in, vii. 215, 216
  petrolatum in, viii. 174
  petrolatum, carbolized in, viii. 174

C. Barker (N. Y. Med. Jour., June 17, 1916) cites 11 cases in which the use of **heavy liquid petrolatum of the naphthene series** proved efficient. Its greatest value was in first and second degree cases; it lessens the pain almost at once and makes an impervious covering over the burned area. It does not stain as does picric acid, is easier to apply than rubber tissue to uneven surfaces, and allows dressings to be easily removed without sticking.

G. De Tarnowsky (Jour. Cutan. Dis., xxxiv, 191, 1916) holds that active antiseptic agents have no place in the present-day treatment of burns. They should be used only in the cleansing of the surrounding intact skin. The burn itself should be let alone as far as cleansing is concerned except for the removal of gross dirt. The method advocated by the author as first-aid treatment is to smear vaseline over the burned area until medical aid arrives.

  phenocoll in, vii. 438
  phenol in, vii. 443
  picric acid in, vii. 461; viii. 174
  potassium nitrate in, viii. 175
  potassium sozoiodolate in, vii. 585

A. Lapthorn Smith (Brit. Med. Jour., Apr. 22, 1916), referring to experience in the war, states that since the loss to the patient through escape of pus is very great, it should be gauged by weighing the dressings before and after application, or by measuring the pus collected through a siphon drainage tube, with or without vacuum suction. The exhaustion from this loss should be met by the internal administration of the **phosphate** or **hypophosphite of iron.** Among antiseptics **potassium permanganate** has proved of the utmost value, either in concentrated solution, or in the form of the finely powdered crystals introduced into every crevice of the wound. The best results in the treatment of extensive burns have been secured by the initial application of a thick layer of **zinc oxide ointment** covered air-tight with ordinary table oilcloth. The ointment should be made with petrolatum as the base. Where **grafting** has to be done the extremity should be kept continuously extended until healing is complete to avoid the deforming effects of contraction of scar tissue.

  protargol ointment in, viii. 137
  quinine in, iii. 391
  removal of necrosed tissue in, viii. 175
  saline solution infusions in, viii. 175
  silver nitrate powder in, viii. 137
  skin-grafting in, viii. 175
  sodium bicarbonate in, viii. 174, 189

W. B. Thorne, in a letter to the Lancet, of Feb. 10, 1917, refers to the marked relief afforded by a solution which he describes: "a washing basin half-full of water in which a breakfastcupful of **bath salt** had been dissolved overnight, and to which he added a dessertspoonful of **sodium bicarbonate.**" While a temperature of 90° F. caused intense pain, its reduction to 80° F. or less, by adding cold water, afforded complete relief. Used in others it proved as efficient while favoring resolution.

  splints in, viii. 175
  starch in, viii. 174
  sweet oil in, viii. 174
  tannin in, viii. 498
  thiol in, viii. 174
  turpentine in, viii. 174

Burns, local treatment (*continued*).
  white of egg in, viii. 174
  white-lead paint in, viii. 174
  zinc carbonate in, viii. 837
  zinc oxide in, viii. 174, 837
  zinc stearate in, viii. 837
 and hemoglobinuria, v. 403
 electric, viii. 171
  amputation in, viii. 175
  caffeine in, viii. 175
  carbolic-lotion bath in, viii. 175
  chloral hydrate in, viii. 175
  immobilization of parts in, viii. 176

A. MacGregor (Arch. of Radiology and Electrotherapy, Oct., 1915) states that electrical burns are usually sluggish in their healing. Two cases are reported in which treatment was carried out by **ionization**, applying the positive electrode to the ulcerated area which had previously been swabbed with a 1 per cent. solution of **zinc sulphate** in one case and a 1 per cent. solution each of **iodine** and **potassium iodide** in the other. The negative electrode was placed at a short distance—in one case over the forearm, the hand being the seat of the ulceration. The current was gradually increased to 10 milliampères and the treatment kept up for about 20 minutes. Both cases showed rapid improvement.

  mercury bichloride in, viii. 175
  morphine in, viii. 175
  phenacetin in, viii. 175
  potassium bromide in, viii. 175
  protection with sterile gauze in, viii. 176
  removal of necrosed tissue in, viii. 175
  skin-grafting in, viii. 175, 176
  strychnine in, viii. 175
 infected, **potassium-mercuric iodide** in, vii. 584
 of conjunctiva, see Conjunctiva, Burns of, iii. 596; also this Index.
 of cornea, see Cornea, Burns of, iii. 596; also this Index.
 of the ears, iv. 712
 of mucous surfaces, viii. 171
 second-degree, **aluminum borotannotartrate** in, i. 589
 severe, **pepsin applications** in, vii. 363
 X-ray, viii. 171
Bursæ, diseases of, viii. 508
Bursitis, **Bier's hyperemia** in, v. 593
 acute, viii. 508
  aspiration in, viii. 508
  blue ointment in, viii. 508
  elevation of part in, viii. 508
  fomentations, cold or hot antiseptic, in, viii. 508
  free opening in, viii. 508
  ichthyol in, viii. 508
  immobilization in, viii. 508
  iodine in, viii. 508
  iodoform gauze in, viii. 508
  phenic acid in, viii. 508
  pressure in, viii. 508
  rest in, viii. 508
  splint in, viii. 508
 chronic, viii. 508
Butlin's technique in cancer of the tongue, viii. 568
Butyl chloral hydrate, see Croton Chloral, iii. 690

Cachectic fever, see Kala-azar, vi. 174; also this Index.
Cacodylates, ii. 699
Cacodylic acid, ii. 699
 poisoning, ii. 703
Cactus grandiflorus, ii. 707
Cade, oil of, ii. 708; vi. 173
Caffeine, iii. 516

Physiological action, iii. 517.—In a study of the effects of caffeine on the intestinal musculature, W. A. Frankland (N. Y. Med. Jour., Aug. 15, 1914) found that it appeared to be stimulating to the nerve centers from which come impulses to the intestinal muscles, causing contractions which are not co-ordinated for peristalsis. There does not seem to be any increase in the activity of the reflexes in the intestinal wall causing the peristaltic wave which would push the mass of intestinal contents downward. The tendency is to intensify contractions which narrow the lumen of the intestine and add resistance to the passage of its contents.

In a study of the effect of caffeine upon the blood-flow in 2 normal human subjects, both at rest and during work, Means and Newburgh (Jour. of Pharm. and Exper. Therap., Nov., 1915) found that with increasing work a steady rise in blood-flow, oxygen absorption, and pulmonary ventilation occurred. The increase in blood-flow was produced first by an increase in systolic output until a a maximum of 118 c.c. was reached, beyond that by an increase in pulse-rate. During rest this action consisted in an increase in total blood-flow without a corresponding increase in oxygen absorption, and hence a decreased coefficient of utilization of the oxygen-carrying capacity of the blood. The pulse-rate was unchanged. Consequently the systolic output was increased.

poisoning, iii. 522
  diet in, iii. 524
  hypnotics in, iii. 524
  large quantities of water in, iii. 524
  sodium bromide in, iii. 524

Therapeutics, iii. 524.—In clinical studies of the effects of caffeine in 15 patients suffering from advanced myocardial diseases, L. Taylor (Arch. of Internal Med., Dec., 1914) found that in *myocardial insufficiency* with retained body fluid, caffeine causes a moderate increase in the urine output with a proportional loss of body weight. This increase reaches its maximum on the fourth day; a drop in both the systolic and diastolic blood-pressures which may stand in a causal relation to the diuretic coefficient, contrary to the usual teaching; a slight (3.6 per cent.) temporary rise in the pulse-rate, but no permanent change in either the pulse or respiratory rate; a moderate relief of the cardiac symptoms; the constant appearance of distressing nervous and gastric symptoms. The clinical diuretic action of caffeine may be better performed by large doses of theobromin sodium salicylate without the unpleasant side effects.

Caisson disease, iii. 542

Caisson sickness and caisson paralysis may, according to R. J. Sewall (Journal-Lancet, May 15, 1915), be classed as an accidental injury, coincident to a lowered bodily metabolism and preceded by a certain amount of shock, due to mental anxiety. This is borne out by a number of his cases, where illness occurred the first shift that the patient worked. Further, in which from whatever cause, there is an engorgement and a certain amount of stasis of the blood in the larger vessels of the trunk. Let this condition be augmented by an excess of nitrogen gas in the blood-stream, the pressure becomes still greater and the traumatism occurs.

Solovtzoff (Roussky Vratch, June 7, 1914) in a study of the effect on the blood of work in caissons, found a form of anemia characterized by a decrease in the red blood-cells, hemoglobin, and often the white cells. The morphological changes in the cellular elements consisted in an increase of microcytes, a decrease in the polymorphonuclears, and an increase in the lymphocytes and eosinophiles. Occasionally, hyperleucocytosis was observed. With cessation of the work the blood returned to normal in 4 to 6 weeks.

Erdman (Amer. Jour. Med. Sci., Apr., 1913) collected 3.1 c.c. of gas by aspiration from the right heart at the autopsy, 14 hours *post-mortem*, of a man who died in one hour after a 17-minute decompression, following 8 hours' exposure to + 30 pounds pressure. On analysis this gas yielded nitrogen 80 per cent., CO_2 20 per cent., which percentages are in accord with analyses made in animal experiments by various writers.

calomel in, iii. 547
catheterization of Eustachian tubes in, iii. 547
counterirritant ointment in, iii. 546
diet in, iii. 547
electricity in, iii. 546, 547, 548
electrotherm in, iii. 546
ergot in, iii. 548
exercise in, iii. 546
faradic current in, iii. 546
high-frequency current in, iii. 546
hot baths in, iii. 546, 548
hot-water bags in, iii. 546
inflation of middle ear in, iii. 547
ironing of painful part in, iii. 546

Caisson disease (*continued*).
  jalap in, iii. 547
  massage in, iii. 547
  morphine in, iii. 547
  oxygen in, iii. 548
  quiet in, iii. 547
  recompression in, iii. 546, 547
  rest in, iii. 547
  strychnine in, iii. 547, 548
  vibratory massage in, iii. 546

Bornstein (Berl. klin. Woch., May 18, 1914) states that active muscular work during the process of slow decompression is the best method known of preventing the disease. Such exercise materially hastens the removal of the nitrogen from the blood and lungs.

Cajuput oil, ii. 709
Calabar bean, see Physostigma, vii. 456
  poisoning, atropine in, ii. 452
Calcaneum, fracture of, iv. 791
Calcium, ii. 710
  creosote, iii. 679
  hypophosphite, vii. 448
  its rôle in the blood, v. 416
  lactophosphate, syrup of, vii. 449
  phosphate, precipitated, vii. 448
  poisoning, ii. 715
    citric acid in, ii. 715
  sterilization.

Antonovsky (Roussky Vratch, Apr. 21, 1912) found that the active agent in *sterilization of drinking water* by means of calcium chloride is not the chlorine, as supposed, but the oxygen, calcium chloride being a double salt ($Ca(ClO)_2 + CaCl_2 + 4H_2O$), in which the oxygen is given off readily and absorbed by the water. A prolonged action is required to insure complete sterilization. If the contact of small amounts of chloride with the bacteria is short, there is only a partial germicidal action and an inhibition of bacterial growth. The virulence of the bacteria, following incomplete sterilization, is not changed.

Archipiantz (Roussky Vratch, Apr. 30, 1916) in a study of the *limitations of calcium chloride* tablets *for the sterilization of drinking water* by troops, ascertained that their efficiency depended not only on the kind of the germ, but also on its resistance to the action of germicides. The cholera spirilla are destroyed very readily. Some of the other micro-organisms require a much longer contact. In the presence of considerable organic matter in the water, a larger quantity of chlorine is required. Also, the amount of chlorine will be influenced by the reaction of the water. In the author's experiments, 2 milligrams ($\frac{1}{32}$ gr.) of chlorine to the liter (quart) of water killed the cholera spirilla in 10 minutes; the typhoid bacilli were destroyed in 2 hours and 40 minutes; the dysentery bacilli in 2 hours and 45 minutes; and the colon bacilli in 3 hours and 5 minutes. In view of the uncertainty of the action of chlorine when thus applied to the sterilization of drinking water, the author is of the opinion that these tablets should receive limited application, namely, when other means of sterilizing the water are not available.

Calculi and hematuria, v. 400
  in bladder, see Vesical Calculi, viii. 724
  in prostate, viii. 704
  intestinal, see Intestinal Calculi, v. 757
  of pancreas, i. 92
  renal, vi. 192
  ureteral, ii. 456
  urethral, viii. 683
Calisaya, see Cinchona, iii. 345
Callus formation, delayed, strontium salts in, viii. 408
  incomplete, Bier's hyperemia in, v. 592
Calomel, vi. 653, 675
Caloric test for labyrinthine lesions, v. 685
Calumba, ii. 721
Calvities, see Alopecia, i. 570
Calx, ii. 710
Cameroon fever, see Malarial Fevers, vi. 477; also this Index.
Cammidge's reaction, vii. 288
Camp fever, see Typhus, viii. 665
Camphor, ii. 722

Romanelli (Policlinico, Jan. 28, 1917) found that a scrap of gum camphor, while floating on the surface of the fluid, and dissolving slowly, seems to destroy germs entering the bottle. White of egg was thus kept unaltered for 10 years. Solutions for hypodermic injection were found to keep indefinitely without growth of micro-organisms, while in control solutions, all kinds of molds and bacilli rapidly proliferated. Even the presence of a substance capable of dissolving the camphor, such as alcohol, in the fluid, does not prevent the effect.

Crouzon (N. Y. Med. Jour., from Bull. et mém. de la soc. méd. des hôp. de Paris, Apr. 24, 1914) refers to the fact that the large amounts of camphorated oil now frequently injected in the treatment of pneumonia, collapse, acute peritonitis, etc., sometimes leave annoying local indurations, and may even lead to abscess formation. To avoid this he has sought to devise a solution which would be more rapidly absorbed, and now uses the following combination:

℞ *Camphoræ* ...... gr. xv (1 Gm.).
Ætheris .... ♏xxj (1.3 c.c.).
Olei olivæ ...... ℥iiss (10 c.c.).
M. et ft. solutio.

The olive oil should previously have been washed with alcohol and sterilized. Clinical experience with the foregoing solution clearly showed its superiority over the official camphorated oil.

Schule (Münch. med. Woch., Jan. 6, 1914) recommends ether as the vehicle for camphor in intravenous injection. There was no evidence of a reaction on the part of the vein to intravenous injection of ether; no thrombus formed even when the injection in the median vein was repeated 20 to 30 times.

-chloral, ii. 733
-menthol, vi. 648
mineral, see Naphthalene, vi. 785
-phenol, ii. 733
poisoning, ii. 725

Austregesillo (Semana Medica, Mar. 4, 1915) describes 5 cases in which epileptiform seizures were caused. The camphor had been prescribed for gonorrheal urethritis but the patients took the doses too often. In the fifth patient the camphor had been prescribed to relieve a painful cystitis, 1.5 gram (23 gr.) in the course of 2 hours. The convulsion occurred the following morning. There was only 1 seizure in each case, but all described it as resembling a typical epileptic seizure. The camphor had been given with hexamethylenamine in all.

Haas (Amer. Jour. of Obstet., June, 1916) observed an instance of death following ingestion of 1 dram (4 Gm.) of camphorated oil in a baby 3 weeks old. The maximum temperature was 100.6° F. (38.1° C.) and the child only showed signs of bronchitis, which had been diagnosed before the camphorated oil was administered. After 43 hours the child died very suddenly in a cyanotic attack. In contrast with this case is one reported by D. J. Milton Miller (Jour. Amer. Med. Assoc., Aug. 15, 1914), in which a baby of 18 months was given a brimming teaspoonful of camphorated oil by mistake, containing from 14 to 15 grains (0.91 to 1 Gm.) of camphor, without causing any symptoms of note.

belladonna in, ii. 726
bromides in, ii. 726, 729
caffeine in, ii. 728
chloral hydrate in, ii. 729
chloroform in, ii. 729
emetic in, ii. 729
glonoin in, ii. 727
lavage of stomach in, ii. 729
massage in, ii. 728
nux vomica in, ii. 728
potassium bromide in, ii. 728
salt solution in, ii. 727, 729
strychnine in, ii. 727, 729
strychnine nitrate in, ii. 727
sugar in, ii. 729

Therapeutics, ii. 729.—According to Heard and Brooks (Amer. Jour. Med. Sci., Feb., 1913) after a clinical and experimental study, camphor exercises a favorable effect upon the heart muscle, when it is poisoned by chloral, muscarine, or strychnine, but the authors consider it unreliable as a cardiac stimulant. Hare (Therap. Gaz., Apr., 1913) states that broken compensation in valvular disease of the heart, with cardiac failure, is not suited to camphor, but that while we may not be able to explain satisfactorily why it acts as a cardiac stimulant, the fact remains that such is the case when the drug is employed in the proper sort of cases.

Camphor, borneol, and menthol, in dilution of 1:2500 to 1:5000, acts as vasodilators, according to Lichatcheva (Roussky Vratch, May 21, 1916). This view is based on experiments on the isolated ear and heart of rabbits. Camphor was found also to exert a beneficial influence on the neuromuscular mechanism of the heart, increasing its blood supply and nutrition.

tar-, see Naphthalene, vi. 785
Camphorated betanaphthol, vi. 787
oil, ii. 722
tincture of opium, ii. 722, 733
Camphoric acid, ii. 723, 732
Canada balsam, see Turpentine, viii. 632
pitch, see Tar, viii. 500
Canadian hemp, see Apocynum, ii. 59
Cancer, ii. 734

Diagnosis, ii. 772.—Olson (Urol. and Cutan. Rev., xx, 546, 1916) holds that the danger of metastasis following a biopsy, *i.e.*, removal of a small piece of tissue (size of a grain of wheat) or a larger piece removed by the cautery for diagnostic purposes, in cancer of the skin and mucous membrane, has been very greatly exaggerated. An early and absolutely certain diagnosis is so important in cases of skin and mucous membrane, that it should be made at once in every suspicious case.

A study of the *leucocytes with relation to their form, ameboid movement, death form*, etc., in cases of malignant diseases, led Gruner (Brit. Jour. Surg., Jan., 1916) to the following conclusions: If the smear shows neutrophilia, and fat drops in many of the neutrophils; if the nuclei of the neutrophils are largely multifid, the case is one of a coccal infection of great or very great severity. If the smear shows a relative abundance of lymphocytes (especially of the very small variety); if there is no leukocytosis; if multifid nuclei preponderate, the case is almost certainly not one of malignant disease. If there is neutrophilia, with bizarre forms, or pseudopods in number; if the lymphocytes are in many instances showing ameboid outlines; if the monocytes show ameboid nuclei the case is almost certainly one of malignant disease.

M. P. Michajloff (Roussky Vratch, Apr. 6, 1913) found—and his view has been confirmed by Blumenthal and others—that in suspected malignant growths, a rise of temperature following a *rectal injection of potassium iodide* (4 Gm.—1 dram—with sodium bicarbonate 2 Gm.—½ dram—and water 90 c.c.—3 ounces) differentiates malignant growths from syphilis. He compares this reaction to tuberculin and deems it equally specific. R. Robinson (Bull. de l'Acad. de Méd., Paris, Dec. 16, p. 544, 1913) also states that the diagnostic value of potassium iodide reaction in cancer is comparable to that of the tuberculin reaction in tuberculosis.

According to J. Phillips (Amer. Jour. Med. Sci., Feb., 1915), too little importance has been attached to *continued high fever* in malignant tumors; that it occurs in a considerable number of cases has been noted and reported by various authors. He reports a personal example of continued high temperature in adenocarcinoma of the kidney. Of 475 cases reported by Freudweiler, 189, or 39.8 per cent., had fever.

Abderhalden test in, v. 392

C. F. Ball (N. Y. Med. Jour., July 4, 1914) holds that Abderhalden's test has already proved serviceable. The presence of cancer in any part of the body calls for the production of a "protective ferment" to destroy the cancer invasion, if possible, otherwise to resist the invasion to the end. The test simply determines the presence or absence of this special ferment. Suspicious conditions in various parts of the body causing anxiety may thus be examined without submitting to the frequently delayed examinations otherwise necessary. The association of this reaction with X-ray method affords the best means possible of making an accurate diagnosis in diseases of the stomach and bowels. The X-ray locates the difficulty, and the blood reaction determines its true nature.

Conversely, according to Fulchiero (Riforma Medica, Nov. 14, 1914), the reaction cannot be considered specific. Faulty technic is not the explanation, as the utmost care was taken. There seems to be a partial reason in the various cellular types found in malignant tumors. For instance, a serum from a patient suffering from a cylindrical celled carcinoma, or a round cell sarcoma, may not react with the serum of one suffering from squamous cell carcinoma, or fusiform cell sarcoma. In 35 cases of undoubted carcinoma from a clinical standpoint, and verified either by autopsy or microscopically, there was a positive reaction in 21, giving a percentage of 60. In 45 serum controls in cases of various nature, there was a positive reaction in five cases, or 12.19 per cent. This shows that there may be a variation in two directions, as there may be failure to get the reaction in undoubted cases of malignancy, and, on the other hand, there may be obtained a positive result in conditions where it should not occur.

[An essential fact is generally overlooked. This is that inasmuch as we are dealing with *autogenous* defensive ferments, all patients are not capable of producing them with equal activity. If, as I believe, the ductless glands, the thyroparathyroid apparatus, the pancreas, and the adrenals in particular, are the main source of these ferments, we have a solid foundation for this fact, all such organs after a more or less prolonged period of exaggerated activity to cope with the toxemia, and also with the detritus through the phagocytes, yielding finally and becoming exhausted. When this stage is reached, or in individuals who are unable to react defensively to any extent, as is often observed in various febrile infections, we should not expect a positive Abderhalden. The negative cases should not, if this explanation is sound, be regarded as militating against the value of the test. C. E. de M. S.]

Sufficient evidence is available to show, according to Brockman (Lancet, Nov. 15, 1913), that the blood of carcinoma cases contains a substance absent in the blood of all others, that it has a proteolytic action on the carcinoma tissue only, and that it is of the nature of a ferment. When the serum from a patient is allowed to become stale, it is also inactive, but the addition of a trace of fresh human serum will activate it again. The reaction takes place best at 37° C. At room temperature the reaction does not occur, while heating the serum to 55° C. for 5 minutes inactivates it beyond recall. If, then, as is maintained, this substance is of a protective nature, it would be natural to expect to find it present in larger quantities in patients who were in good general health. The results of these tests point strongly to such being the case. The writer has noticed throughout the whole series that a patient with a growth of the tongue or of the breast who is in good general condition will give an intensity of coloration in 12 hours which a patient in a low state of health would fail to give in 24 hours.

Goodman and Berkowitz (Surg., Gynec. and Obstet., xix, 797, 1914) obtained 30 positive Abderhalden reactions out of 33 cases of cancer, the results obtained corresponding to the operative, clinical, and *post-mortem* findings. They emphasize the following imperative precautions to be observed in order to obtain satisfactory results: 1. Absolute asepsis and especial cleanliness in caring for the glass-work. 2. The substrate must be thoroughly macerated, for, as Abderhalden emphasized, unless the tissue has been minutely divided before boiling it cannot be entirely freed from blood. The substrate must be tested before each series of reactions. 3. The serum must be centrifuged until all traces of red blood-corpuscles are removed. Discolored serum should be discarded. 4. The thimbles must be tested and then handled with great care to avoid reaction due to perspiration or bacterial contamination. Blowing the water from the wash-bottle may contaminate it with saliva sufficient to produce conflicting results.

As to the other tests that have been proposed, W. Seaman Bainbridge (Med. Record, Jan. 13, 1917) in a recent review concludes that the clinician has been given no reliable aid to diagnosis in the early stages of cancer by the continued researches. Coca (Jour. of Cancer Research, Jan., 1917) compares the von Dungern and the Freund-Kaminer tests. The *Freund-Kaminer tests* were based upon the assumption that isolated cells of carcinoma are dissolved by the serum of non-cancerous individuals, whereas this property is lacking in the serums of cancer patients. In more than 150 experiments no cytolysis was observed. It therefore seems evident that this reaction cannot be made the basis of a differential test for malignant tumors. The *von Dungern reaction* is a complement fixation test in which an antigen composed of an acetone extract of human blood-corpuscles is used. Thirty-six cancer serums and an equal number of non-cancerous serums were tested, and in no instance was a fixation of complement obtained that could not be explained on other grounds. In a further series of 98 serums from cases of carcinoma and sarcoma 13 were Wassermann positive, and of these 4 caused complement fixation also with the blood-extract, which was prepared from washed blood-corpuscles from a case of tertiary syphilis. In no other case was complement fixation observed that could be interpreted as a reaction of diagnostic value.

M. Kahn (Jour. Labor. and Clin. Med., ii. 103, 1916) found the test for gastric protein by means of the Wolff-Junghans modification of the Solomon method very useful. A negative result speaks against malignancy, but a positive result may also be given by gastric ulcer and acute and chronic gastritis.

Etiology, ii. 737.—W. S. Bainbridge (Med. Rec., Jan. 13, 1917), in a general review of the cancer problem, states that none of the investigations regarding the etiology have revealed anything concerning the cause of cancer which need give rise to a radical change in the generally accepted views with regard to the treatment of the disease. The laboratory investigations with regard to heredity should be continued, but it is deplorable that, in this stage of knowledge, this possible factor in etiology should be brought to bear in the effort to control cancer in the human subject. The advocacy, on the basis of these findings, of the "eugenic control of matings" has already given rise to vastly more mental suffering than is warranted by the facts in hand. Whatever part soil and diet and other allied factors may play in the cause of cancer, the findings so far published do not warrant the application of deductions therefrom to the "diet-plus-régime" method of treating cancer, if this is to exclude the early and radical removal, by surgical means, of the cancer. The findings with reference to the causative effects of prolonged irritation reinforce the view that it is important, wherever possible, to eliminate this factor by rational means.

A. Robin (Bull. de l'Acad. de méd., Apr. 10, 1917) observed 12 instances of cancer among 144 fatal cases of diabetes. It generally appeared in long standing diabetes, and the author believes the latter in a measure predisposes to the former.

Prognosis.—Comparing the present state of cancer surgery with that of

30 years ago, H. Lilienthal (Maryland Med. Jour., lix, I, 1916) concluded that there is now justified hope, where before there was a feeling of helplessness. Markedly better results are obtained in mammary cancers, owing mainly to the earlier stage at which they are seen and the extension of the operation to include removal of the pectoral muscles and removal of the axillary glands.

According to J. C. Bloodgood (So. Med. Jour., July, 1915), good surgery should promise 100 per cent. of cures in all cases in which the carcinoma is still a local growth. The figures, 50 per cent. inoperable and 50 per cent. cured of the operable, giving about 25 per cent. of cures, vary to a slight degree with cancer in different regions, and with different types of cancer in the same region. It is a question whether bad surgery ever cured a case. We should try to educate the public to get this good surgery at once, when it promises most. Delay after the first warning is dangerous. Trifling with any other treatment is gambling with death; and physicians are often responsible for such procrastination and trial of doubtful methods of treatment.

Prophylaxis.—Notwithstanding all accumulated experience, and efforts at early diagnosis and the most thorough operations possible, the mortality rate from cancer, as stated by A. C. Wood (N. Y. Med. Jour., July 18, 1914), is steadily increasing. The recent additions to cancer therapy, the X-rays, radium, and mesothorium, have been found to possess but very limited usefulness. In the present state of knowledge any marked reduction in the death rate from cancer can be brought about only by arresting precancerous stages of cancer.

W. J. Mayo (Annals of Surg., June, 1914) urges that the precancerous lesions are produced by some habit of life condition which causes chronic irritation, and that a close study of the habits of civilized man as contrasted with primitive races and lower animals, in which similar lesions are conspicuously rare, is necessary. The prophylaxis of cancer depends, he holds, first, on a change in those cancer-producing habits, and, second, on the early removal of all precancerous lesions and sources of chronic irritation.

The end-results of 1000 operations for carcinoma of the abdominal viscera from the statistics of Bunts, Lower, and Crile's own work (Interst. Med. Jour., xxii, 722, 1915) at the Lakeside Hospital, that the number of deaths that remain unexplained by the patients' apparent condition before operation is striking. The succession of symptoms in general is as follows: loss of vitality, thirst, anorexia, depression, drowsiness, unconsciousness, and death in spite of the fact that the operative wounds are healing normally. This is attributed to increase of the acidity. The normal reaction of tissues is alkaline, and life is incompatible with a neutral or acid condition. In order to combat this tendency, food, water, glucose, and sodium bicarbonate are pushed before the operation. Every possible psychic aid should be employed to diminish all emotional stress incident to the operation. Nitrous oxide is used as an anesthetic rather than ether, as it causes less marked changes in the brain, adrenals, and the liver, and at the same time protects them to a certain extent from surgical trauma. Anoci-association is employed throughout the operation, because operations done under this method show no increased acidosis.

According to L. D. Bulkley (Med. Rec., May 15, 1915) the greatest safety lies in a vegetarian diet, with the single exception of butter.

Treatment, ii. 776.—Our sheet anchor in all cancers within reach still remains by all odds surgical treatment, and the earlier and more radical the procedure the better; but where it cannot be resorted to, the X-rays should be given preference over radium, the excessive cost of which seems to have been a potent factor in procuring for it a position in our therapeutic armamentarium out of all proportion to its relative value.

actinium in, ii. 791
adrenal gland in, ii. 785
adrenalin in, i. 771; ii. 784
alcohol in, i. 538
antimeristem (Schmidt's) in, ii. 800
arsenic in, ii. 146
ascitic fluid in, ii. 799, 802
autolysates of human fetuses in, ii. 780, 799
bacillus prodigiosus in, ii. 800, 801
belladonna in, ii. 499
blood-pressure in, ii. 498
Bougard's paste in, ii. 786
calcium carbide in, ii. 721
cancroidin (Schmidt's) in, ii. 800
Canquoin's paste in, ii. 786
carbolic acid in, ii. 787
carbon dioxide snow in, ii. 788
charcoal in, iii. 122
chromic acid in, ii. 787
cocaine anesthesia in, iii. 493
cocaine cataphoresis in, iii. 499
cocaine hydrochloride in, ii. 787; iii. 493, 499
Coley's mixed toxins in, ii. 800, 801
colloidal copper in, iii. 646
condurango in, iii. 550
conium in, iii. 550
curetting in, ii. 788
cytolytic sera in, ii. 803
diet in, ii. 780
embryonic tissues in, ii. 795
epinephrin in, ii. 784
ethyl aminobenzoate in, iv. 693
excision of, cocaine anesthesia in, iii. 484
Finsen light in, ii, 791
freezing in, iii. 530
fulguration treatment in, ii. 792
galvanic cautery in, ii. 788

The use of various forms of **heat** in inoperable cancer is being increasingly advocated. The **d'Arsonval current**, according to Tennant (Colorado Med., June, 1916), is a very potent means of obtaining the same or even better results than by Percy's method in tumor masses. In every test made, the d'Arsonval current raised the average temperature of a given mass 24° F. higher than the latter irons did, in one-half the time.

W. J. Gillette (Med. Rec., Jan. 8, 1916) employed **superheated steam** in 16 cases with remarkable success in large fungating carcinomatous and sarcomatous masses. It does not, however, readily permeate fascia or fat, which should be pierced by multiple scalpel punctures before employing this method. It seems to have a selective action on malignant tissues and also greatly to alleviate pain. Small metal shells are used with a wooden handle, and a steam pressure of from 50 to 55 pounds is used to cause penetration.

A rapid cure of an intractable ulcer by the application of direct **sun rays,** after several months' treatment by other methods, was obtained by W. W. Stevens (N. Y. Med. Jour., July 24, 1915), who inquires whether we may not have in the sun all that has been claimed for the X-ray.

Concentrated **sunlight,** focused on small superficial epitheliomatous growths, particularly in obstinate recurrent ulcerative patches on the face or nose, was found effectual by Seelye (N. Y. Med. Jour., Feb. 7, 1914) when X-rays or radium were not available, focusing it on the sore with a magnifying glass for 10 or 15 minutes at a sitting. When a scab is present, he concentrates the rays till burning is felt, then lengthens the focus to cover a wider area. He induces burning for a second, and repeats this every few minutes. He treats it every day or two till the scab is easily removed, then applies a little cocaine, and after 3 or 4 minutes applies the sun rays so as almost to cauterize the base of the ulcer. He then alternates with milder applications for 15 minutes. Under milder treatments thereafter, at longer intervals, cure is usually complete in 3 to 6 weeks.

high-frequency current in, ii. 793
hydrogen dioxide in, ii. 788
hygiene in, ii. 780
inoculation in, ii. 795
leucodescent lamp in, ii. 792

Cancer (*continued*).
  liquid air in, ii. 788
  Marsden paste in, ii. 785
  mesothorium in, ii. 791
  methylene blue in, ii. 781
  neoformans vaccine in, ii. 375
  non-surgical treatment in, ii. 780
  organotherapy in, ii. 783
  pepsin applications in, vii. 363
  petroleum applications in, vii. 413
  potassium chloride in, ii. 787
    dichromate in, vii. 576
    hydroxide in, ii. 785, 786, 787; vii. 576
  quinine in, iii. 387

Garnak (Roussky Vratch, Apr. 30, 1916) combined the ideas of Jaboulay (quinine) and Michailoff (iodides) and treated a number of cancer patients with **quinine hydroiodide** in doses of 0.5 grams (7½ gr.) 3 to 4 times daily. This preparation is found in commerce, but can be prepared extemporaneously by mixing 0.95 gram (14¾ gr.) quinine hydrochloride with 0.4 gram (6 gr.) potassium iodide. The author asserts for this preparation the disappearance of the malignant growth and of the glandular metastasis, as well as improvement in the patient's condition.

radium in, ii. 785, 790

G. C. Boughton (Jour. Amer. Med. Assoc., Oct. 23, 1915) calls attention to the fact that most of the cases of cancer in which **radium** treatment has been used have been inoperable cases; many of the patients have been almost moribund, and in this type of cases radium treatment has achieved what no other treatment could do. We should not replace surgery by radium therapy, but rather, by combination with radium therapy, make surgery more effective. The surgeon can remove the greater part of the malignant tissue, but the radium rays in suitable cases can go in and destroy all of the remaining malignant cells.

T. C. Kennedy (Jour. Ind. State Med. Assoc., July 15, 1916) holds that while **radium** is not a cureall, it will cure every case of epithelioma that is amenable to treatment. When used judiciously it is a painless, safe, and efficient method of treating malignant skin affections, and is to be preferred in epithelioma of the face. The number of treatments varies, improvement usually is noticed after two or three exposures, and frequently after the first. The analgesic action is marked, and is frequently noted after the first application.

Radium irradiation affects malignant cells as follows, according to Morson (Brit. Jour. of Surg., Jan., 1915): 1. Rapid degeneration of the malignant cells in the immediate vicinity of the tube of radium. 2. Apparent vacuolation and enlargement of nuclei of those cells beyond the degeneration zone. 3. Loss of the reproductive function of the cancer cell. About the third day after treatment the connective-tissue cells commence to proliferate. This action of radium on the connective-tissue cells shows a similarity to the attempt of nature to arrest the growth of cancer through new formation of fibrous tissue. If an excessive quantity of radium or too prolonged an exposure be given, not only necrosis of the whole tumor results, but the normal tissues slough also.

Since he first called up the subject at the British Medical Association, Robert Abbe (Jour. Amer. Med. Assoc., July 17, 1915) has been more deeply impressed with the importance of **radium** in the cure of *Röntgen-ray cancer*. It is only in the advanced stage of the latter that radium is not beneficial. His first case so treated was in 1903, and 1 application of radium cured the epithelioma. The great advantage in the radium treatment is that it can be applied in many situations not accessible to freezing, and its relative freedom from pain. No cases have presented themselves to the author of chronic dermal Röntgen-ray disease in the early stages of thick patches, cracked, ulcerated and painful, or of the epithelial growths of basal-cell type on the back of the left hand of those who have in past years used that hand which have not yielded to radium therapy.

The *ultimate untoward effects of radium* have been noted by various observers. It promoted instead of checking cancer in a number of cases observed by T. Rovsing (Hospitalstidende, July 8, 1914). Small, hitherto indolent, and benign superficial growths were fanned into rapid malignant growth apparently by the exposure to radium. The growth became intensely painful as a rule after the radium exposure. This was particularly evident in the case of a man of 29 who had been given radium treatment at Omaha for a suspicious lump on his lower lip noticed for two years. After the radium exposure the lump began to grow rapidly, and when it was then excised, recurrence rapidly followed.

Tscherning (Ugeskrift for Laeger, July 16, 1914) protests against Rovsing's conclusions, declaring that all of the 10 cases reported were hopeless from the start, as evident from the published details, or else the dosage was inadequate or the technic defective. In the 200 cases treated at the Copenhagen radium station during the last few years there was nothing to suggest in the remotest Rovsing's experiences.

[Our Associate Editor, H. H. Janeway, holds that radium usually produces a selective destructive action on cancers, but that this action never reaches to the more distant extensions of the deeper and more serious forms. Unless the greatest care is taken in its application, the more distant portions of the tumor will be stimulated to more active growth. All observers of the action of radium on cancer have expressed the belief that an insufficient dose of radioactivity may stimulate tumor growth. All who use radium believe that no operable cancers, except those of the skin, should be treated with radium instead of operation. He considers that the true position of radium in the treatment of cancer, with the present methods of application, is a settled matter. While it will destroy cancer tissue in a dose not affecting normal tissues, it does not cure the disease unless quite superficial or of a variety peculiarly susceptible to radium. The fact that we have in radioactivity an agent which will specifically affect cancer is of very great importance, as no other agent has thus far been discovered which in any degree approaches its effectiveness. C. E. de M. S.]

Early metastasis after radium or X-rays had caused malignant tumors to disappear was observed by Kirmisson (Bull. de l'Acad. de Méd., Paris, July 4, 1916). Thus in an inoperable sarcoma in which radium caused in 4 months almost total disappearance of the growth, a large tumor speedily developed in the iliac fossa of the same side. In a second case in a girl of 12, in which the tumor presented the characteristics of a periosteal sarcoma, radiotherapy caused its virtual disappearance in a few months, but as this subsided there was metastasis in the spine, the vertebræ bulging in the lumbar-sacral region and the child suffering intense pain and unable to move her legs. Kirmisson emphasizes that in estimating the clinical value of radiotherapy, the end-results have not been regarded enough. When they are taken into account, the outcome of radiotherapy for sarcomas is found less favorable.

reinoculation in, ii. 796
salvarsan in, ii. 781
selenium in, ii. 782, 783
serum in, ii. 794, 796
sodium cacodylate in, ii. 701
sodium chondroctin sulphurate in, ii. 783, 799
spermatocele fluid in, ii. 802
splenic tissues in, ii. 795, 799
strychnine in, vii. 147
supracapsulin in, ii. 784
surgical measures in, ii. 779
tellurium in, ii. 782
thymus gland in, i. 793; ii. 784
thyroid gland in, i. 732, 733; ii. 781, 785

Mikhailoff (Roussky Vratch, Apr. 12, 1914) strongly recommends **potassium iodide** in internal cancer, preferably in the form of rectal injections (4 Gm.—1 dram—potassium iodide; 2 Gm.—½ dram—sodium carbonate and 80 or 100 c.c.—2⅔ or 3⅓ ounces—distilled water), supplemented with 1 per cent. solution of sodium arsenate (sodium arsenici) hypodermically, which solution must be made with 0.25 per cent. phenol.

He found that potassium iodide showed a special affinity for cancer cells in the test-tube, and his clinical experience indicates that this is the case also in the human body.

trypsin in, ii. 788
tumor tissue in, ii. 795
vaccines in, ii. 375, 780, 794, 798, 799
X-rays in, ii. 788, 789, 793; viii. 828

Forssell (Hospitalstidende, Mar. 21, 1917) reviews the results of treatment of 1015 cancer patients with **radium** often in conjunction with the **Röntgen rays.** In 207 cases of deeply rooted inoperable cancer in different organs, primary or recurrence, a clinical cure was realized in 14; 35 were permanently improved, and 86 failed to be benefited.

A. F. Holding and W. B. Long (Trans. Amer. Med. Assoc.; N. Y. Med. Jour., June 9, 1917) found that both **radium** and **X-rays** act upon the cell nucleus by preventing the consummation of the mitotic process after it has started, but they probably were without direct effect on the resting nucleus. They also act on the endothelial lining of capillaries, producing a swelling of the lining cells which may go on to complete occlusion. They also induce indirect destruction of large numbers of cells by inhibiting their nourishment.

Grubbe (Interstate Med. Jour., xxiii, 149, 1916) reports that of his 139 cases of skin cancer cured by **X-rays** 2 have remained free from recurrence 14 years, 2 for 15 years, 3 for 12 years, 2 for 11 years, 3 for 10 years, 4 for 9 years, 3 for 8 years, 6 for 7 years, 8 for 6 years, 14 for 5 years, 20 for 4 years, 20 for 3 years, 25 for 2 years, 27 for 1 year. Sixteen cases were lost from observation, some having died from intercurrent disease. Although 500 cases have come under observation, the author has confined this list to 155, where the rays were used exclusively.

According to G. E. Pfahler (Surg., Gynec. and Obstet., Jan., 1917), malignant disease should be, as far as possible, completely **removed surgically,** or it should be destroyed by **electrothermic coagulation.** Each operation for malignant disease should be followed by post-operative **Röntgen treatment.** The extent and character of the post-operative treatment will depend on the location of the disease. When there is an absolute necessity for delay in operation from some other cause, the patient should be treated by means of the Röntgen rays, and the treatment should be especially directed toward the glandular area. This will reduce the malignancy, and help to prevent metastasis.

xenocellular vaccines in, ii. 799
zinc chloride in, ii. 786, 787
arsenical, ii. 143
gastric, see Stomach, Cancer of, viii. 324; also this Index.
immunity in, ii. 794, 795, 796, 797, 798
inoperable, **aspirin** in, ii. 221
iodine (nascent) in, vi. 44, 45
methylene blue in, vi. 687
nitric acid in, vii. 46
potassium permanganate in, vi. 574
labial, vi. 728; viii. 438
of the adrenals, i. 466
of ampulla of Vater, pancreatic opotherapy as diagnostic test in, vii. 299
of the breast, see Mammary Gland, Carcinoma of, vi. 554; also this Index.
of the esophagus, see Esophagus, Carcinoma of, iv. 623; also this Index.
of the eyelids, see Eyelids, Carcinoma of, iv. 723; also this Index.
of the Fallopian tubes, vii. 249
of the larynx, iii. 195; vi. 297; see also Larynx, Carcinoma of, this Index.
of the lip, vi. 728; viii. 438
of the lung, iii. 162; vi. 465
pneumectomy in, iii. 191

Cancer (*continued*).
of the mediastinum, viii. 551
of the mouth, ice in, iii. 531
of the orbit, vii. 212
of the ovary, vii. 255
of the pancreas, vii. 295
of the pericardium, iii. 194
of the prostate, viii. 717
of the skin, see Epithelioma, ii. 765; also this Index.
of the spleen, viii. 315
of the stomach, see Stomach, Cancer of, viii. 324; also this Index.
of the sweat-glands, viii. 448
of the thymus, viii. 534
of the tongue, see Tongue, Cancer of, viii. 567; also this Index.
of the urethra, viii. 703
of the urogenital tract, inoperable, viii. 812
of the uterus, see Uterus, Carcinoma of, viii. 757; also this Index.
of the vagina, viii. 776
rectal, see Rectum, Cancer of, vii. 776
superficial, ice-bags in, iii. 531
ulcerating, formaldehyde in, iv. 735
glyceritum hydrastis in, v. 30
hydrogen dioxide in, v. 568
Cancerous fistula, bismuth paste in, ii. 475
infiltrations, atropine in, ii. 452
ulcerations, chromium trioxide in, iii. 337
hydrastis in, v. 548
orthoform in, vii. 215
perhydrol in, v. 569
quinine lygosinate in, iii. 391
of the epiglottis, vii. 216
of the esophagus, see Esophagus, Cancer of, iv. 623
of the tongue, see Tongue, Cancer of, viii. 567
Cancrum oris, vi. 723, see also Mouth, Diseases of, this Index.
nitric acid in, vii. 46
Canities, v. 151

Lebar (Presse méd., June 10, 1915) observed a soldier of 23, who the day after being thrown into the air by the explosion of a mine, showed patches of white hair on the left side of his head. He concludes that the powerful nervous shock set in movement the medullary cells of the hair to which the pigmentation is due.

Canities (*continued*).
ammonium anacardate in, v. 152
araroba powder in, v. 152
cassia oil in, v. 151
chrysarobin in, v. 152
egg oil in, v. 151
gallic acid in, v. 151
Goa powder in, v. 152
henna in, v. 152
hydrogen dioxide in, v. 152
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Cannabine, iii. 2
Cannabinine, iii. 2
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Cantharides, iii. 9
poisoning, iii. 11
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anesthetics in, iii. 13
bismuth subcarbonate in, iii. 13
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enemas in, iii. 13
laudanum in, iii. 13
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mucilage in, iii. 13
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stomach pump in, iii. 13
washing out of stomach in, iii. 13
Cantharidin, iii. 9

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  hemoptysis, sodium sulphate in, viii. 190
  varix of scalp, v. 165
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Capsular splenitis, see Perisplenitis, viii. 314
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Caraate, see Pinta, vii. 475
Carbolic acid, see Phenic Acid, vii. 438
    burns, alcohol in, i. 535
    gangrene, iv. 796
    poisoning, see Phenol Poisoning, vii. 440; also this Index.
Carbon, see Charcoal, iii. 121
  -dioxide poisoning, oxygen inhalations in, vii. 274
  -dioxide snow, vii. 784
  monoxide poisoning, see Gases, Poisoning by, v. 1; also this Index.
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    aristol in, viii. 166
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    Bier's hyperemia in, v. 591, 592, 593, 594; viii. 166
    boroglyceride in, vi. 37
    calcium phosphate in, vii. 450
    calcium sulphide in, viii. 430
    carbolized petroleum in, viii. 166
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    incision in, viii. 166
    iodine tincture in, vi. 37, 42
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    iron in, viii. 166
    light therapy in, vi. 360
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    potassium chlorate in, vii. 583
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  cycle, electrocardiogram of, v. 322
  liver, see Liver, Congestion, Passive, vi. 372; also this Index.
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  of orbital walls, vii. 213
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  teeth, orthoform anesthesia in, vii. 216
    phenol in, vii. 442

Carlsbad salt, artificial, see Sodium, viii. 179

Carolina pink, see Spigelia, viii. 200

Carotid gland.

Frugoni (Semaine méd., Oct. 9, 1912) found experimentally in rabbits that extracts of the carotid glands of calves, injected intravenously, are capable of causing rapid death. The respiration and cardiovascular functions are strongly depressed, though after death the auricles may continue to beat for some minutes. Marked leucopenia and loss of coagulability of the blood are observed. The blood-pressure is at first slightly raised, then considerably depressed for a prolonged period; slowing and increased amplitude of the pulse are simultaneously noted. The lowering of pressure is not due to depression of the medullary vasomotor center, but of the vessel walls. Repeated injections of carotid gland extract do not cause pathological changes in the vessels. The author concludes that it cannot at present be definitely stated that the carotid gland elaborates a distinctive internal secretion.

In reporting a case of tumor of the carotid body, C. W. Russell (Jour. Mo. State Med. Assoc., xii, 521, 1915) recalls that the embryology of the carotid gland is still in dispute. The third or fourth branchial clefts, the perithelium of the carotid arteries, and particularly the sympathetic nervous system have all been suggested as the source. The organ has an abundant nerve supply from the cranial and sympathetic nerves. The physiology of the gland is unknown, its presence is inconstant, and there is insufficient clinical data upon which to base opinion. It atrophies soon after puberty, and a connection with trophic stimuli of body development has been suggested.

tumors of.

In reporting 2 cases, P. Wetterdal (Hygiea, lxxviii, No. 23, 1916) states that both sexes are about equally represented in the statistics. These tumors are generally benign, and cause no symptoms, but a certain proportion display a malignant tendency and invade the vessels, so that the mortality is about 25 per cent. It was 29 per cent. in the last series of 59 operative cases.

R. Winslow (Annals of Surg., lxiv, 257, 1916) in reporting cases of tumors of the carotid body, states that in 1906 Keen collected 29 cases, and that in 1913, Callison and MacKenty added the reports of 31 more. The author himself collected 10 more cases since that time, and adds 2 cases which have come under his personal observation. The treatment is surgical where there is any hope of complete extirpation, but the operation involves risk, because it is usually necessary to ligate the carotid, and perhaps remove or injure the hypoglossal and pneumogastric nerves. In 25 cases in which the common and internal carotids were ligated, only one died from the operation, which is considerably less than the usual percentage of cerebral softenings following ligations of this type. The tendency to recur when the tumors have been dissected from the vessels warrants radical removal with resection of the carotids.

Shipley and Lynn (Jour. Amer. Med. Assoc., May 20, 1916) report 2 cases of carotid tumor which required ligation of the common carotid, on account of their peculiarities and the rarity of the conditions existing. In 1 the tumor was penetrated by the artery and internal jugular so that both were ligated above and below and the mass removed. The patient made a good recovery, and has had no recurrence after a lapse of 5 years.

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Carpometacarpal dislocations, iv. 322

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Carron oil, ii. 710

Carsickness, sulphonal in, viii. 426

Caruncle, urethral, viii. 703

Cascara sagrada, see Rhamnus Purshiana, vii. 821
Casein silver, see Argonin, viii. 129
  test for pancreas functioning, vii. 289
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Cataract, iii. 42

Edward Jackson (Jour. Amer. Med. Assoc., July 29, 1916) concludes that for monolateral cataract up to middle life, **discission** is to be considered as a proper procedure; and in many cases the patient will prefer it to extraction. The first discission should make only a short opening in the capsule; but may well penetrate to the center of the nucleus, so that disintegration of the latter may begin as soon as possible. The amount of swelling from a given interference will be proportioned to the size of the opening in the capsule, and the absence of previous change in the lens substance. Severe reactions and surgical shock are provoked by the presence of large masses of lens substance in the anterior chamber. Possible hemorrhage from making puncture through the vascular limbus, causes no danger to offset the greater safety from infection secured by this point of entrance.

In 100 successive **extractions** of cataract in the capsule after subluxations with the capsule forceps. A. Knapp (Arch. of Ophthal., Jan., 1915) proceeded as follows: After the usual preparation and instillation of 1 drop of **atropine**, under **holocaine anesthesia**, the Koster speculum was introduced and left in place until the operation was completed, unless there was danger, or an actual prolapse of vitreous. An assistant is necessary only in presence of complications. The section must be large. After **iridectomy** the capsule forceps was introduced to a point below the center of the pupil and a knuckle of capsule was grasped not tightly, so as to tear it, but sufficiently firmly to exert traction on its periphery. The branches of the forceps were then moved gently from side to side, up and down, and rotated until the lens was dislocated, when the forceps were opened and withdrawn. Pressure was then made straight back on the lower part of the cornea with Smith's hook, and the cataract is delivered as in Smith's operation. The iris columns were then carefully replaced. This in his opinion is a legitimate and conservative development of our operative treatment of cataract. It insures for many patients the advantages of an extraction in capsule without subjecting them to a greater risk than is involved in the ordinary operation.

Maynard (Indian Med. Gaz., Apr., 1916), to insure even pressure over the eyeball, uses swabs of wet sterilized wool applied as follows: The wool is pulled, not cut, into pads, about 1 inch thick and 3 inches in diameter. The pads are then sterilized by boiling in 1:5000 **biniodide solution**. After the completion of the operation 2 of these, sopping wet, not wrung out, are laid on both eyes. They are gently pressed down over the eyes, so that the swab becomes molded to the eye and fills in the hollows round it. Over this swab is placed a wet pad consisting of lint or 6 layers of gauze and then a figure-of-8 bandage is applied fairly firmly. On opening the dressing next day the wool gauze will be found dry and forming a complete mold of the eyeball and orbital opening. This wet molding method is very comfortable and produces no feeling of uneven pressure while it allows the eye to move easily, though keeping the eyelids closed.

E. L. Jones (Annals of Ophthal., Jan., 1916) holds that cataract in the aged should not be considered a normal senile change, but a manifestation of some pathological process in the uveal tract, the ciliary body, or choroid, whether it is shown by other symptoms or not. By stimulating the lymphatic circulation of the globe by the systematic use of **dionin drops**, or a sufficiently strong subconjunctival injection of **cyanide of mercury**, an artificial sclerosis of the lens is accomplished which causes the disappearance of the fine dust and the arrest of cataract. He contends that this cures some low grade perversion of the function of the ciliary body, which has to do with the nutrition of the lens. Where there is no perversion of the nutrition of the lens neither dionin drops nor subconjunctival injections show any tendency to induce sclerosis. The solution generally used is 8 grains (0.51 Gm.) of dionin to ½ ounce (15 Gm.) of cyanide of mercury solution 1:1000, three drops in the eye at bedtime. As many eyes get very red and some chemosed from these drops, bedtime is preferred for use, so that these effects may pass off during sleep.

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In a case of late catatonia, Taft and Morse (Jour. of Nerv. and Mental Dis., Sept., 1914) found focal unilateral cerebellar disease of long standing, apparently quiescent, and beyond question due in large measure to arterial thrombosis. There were no histological nor clinical evidences of syphilis, and the pericardial fluid *post-mortem* gave a negative Wassermann. The lesion was not of an old cyst with softening, but rather gradual shrinkage and induration, possibly due to unusually gradual thrombosis.

Southard and Canavan (Amer. Jour. of Insanity, Jan., 1916) report 2 fatal cases of chronic lesion of the left angular gyrus, which had been diagnosticated as dementia precox. These focal lesions of the cortex were associated with late catatonia. One case showed a cyst of softening and the other a solitary tubercle. Both lesions could well be of suitable age to correspond with the date of onset. Decidedly atypical, however, was the age of onset, 41 in one; 36 in the other. The presence of the lesions in the parietal region confirms previous conclusions to this effect in the presence of catatonic symptoms.

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Cecal hernia, v. 491
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Cecostomy, i. 83
Cecum, movable, see also Appendicitis, Chronic, this Index.

The following points are deemed of value by Wilms (Arch. f. Klin. Chir., Bd. xc, Nu. 3, 1911) in the diagnosis of movable cecum: Attacks of colic at intervals, occasionally persistent mild pain, palpation of a regurgitating cecum becoming more resistent when contracting, and frequently increased pressure sensitiveness near McBurney's point. Röntgenography demonstrates stagnation of the bismuth mixture in the cecum. The cecum frequently extends down into the small pelvis and to the median line. The condition often exists in young individuals, and especially in women in middle life. Symptoms of collapse may accompany the attacks. Constipation is important in the anamnesis; occasionally it alternates with diarrhea.

To shorten an elongated cecum, Francke (Zentralbl. f. Chir., Jan. 3, 1914) runs 3 or 4 fine silk threads lengthwise of the gut for a distance of about 8 or 10 cm., taking each stitch about 1 cm. long, at intervals of the same length. Each thread is tied separately. This puckers up the gut like an accordion.

In doing a **cecopexy**, P. Duval (Revue de Chir., May 10, 1914) first makes a large McBurney exposure.

After removal of the appendix the ileocecal junction is elevated and the posterior peritoneum longitudinally incised, exposing the psoas parvus. When this muscle is absent, the inner border of the psoas magnus is used. Several broad supporting sutures are passed. A structure to be borne in mind in dissection is the iliac artery. After the sutures are tied, the 2 flaps of posterior peritoneum are sutured to the lateral aspects of the cecum. Cecoplication, if necessary, is done before the cecofixation.

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Cerebellar ataxia of children.

L. P. Clark (Amer. Jour. Dis. of Children, June, 1913) defines infantile cerebro-cerebellar diplegia as an extreme defect or disease of the cerebro-cerebellar function with relationship to bodily movements, of an unknown pathogenesis (probably based largely, if not solely, on a developmental defect) which is for the most part intrauterine in origin and which we find expressed in clinical manifestations of atonia, astasia, hypotonia, mutism and idiocy. He regards it as a distinct type of palsy of infancy. The disorder not only affects isolated movements, but particularly the association of movements or the motor synerges so-called.

In 10 cases of cerebellar ataxia in children, representing 3 types of the disease which should be identified from tumors, hemorrhage, thrombosis and softening, L. Concetti (Rivista Ospedaliera, June 15, 1914) obtained the following results: In a case due to defective or arrested development in a boy of 3½, gradual improvement was evident under thyroid treatment, bromides, iodides, calcium chloride, valerian, mercurial inunctions, hydrotherapy and massage. Occasional flaccid paralysis of the arm or leg was the first sign of trouble, soon after birth; the paralysis lasted for a few minutes or days and then subsided for a time, and finally came to alternate with epileptiform convulsions. Even at the best the gait was like that of a drunken man with a constant tendency to fall, but improvement was realized under the measures mentioned above while the child was for several months in the clinic, and it has continued to progress during the 2 years to date. He can now walk alone though hesitatingly. Improvement was also obtained under treatment in the 7 infectious cases; the ataxia followed typhoid, measles or pneumonia, or the child or the parents were alcoholic. No benefit was apparent in the 2 degeneracy cases.

Cerebral abscess, iii. 73
Diagnosis, iii. 77

Otitic Origin.—The absence of ocular symptoms does not justify, according to G. B. Jobson (Laryngoscope, xxv, 7, 1915), the exclusion of intracranial involvement complicating aural disease, but when considered in conjunction with other symptoms it is a valuable guide to a timely operation. Choked disc and optic neuritis are the earliest and most important evidences of intracranial involvement.

T. B. Throckmorton (Chicago Med. Rec., xxxviii, 128, 1916) observed a case of cerebral abscess due in all probability to *suppurative tonsillitis.* The portal of entry for the organism causing the temporal abscess may have been through that portion of the skull anterior to and above the right temporomandibular joint, a spot made vulnerable by the loss of the pericranial membrane. At autopsy the dura and surrounding tissues at a point corresponding to the denuded portion of the bone showed marked inflammatory changes.

Gunshot Injury.—Marburg and Ranzi (Surg., Gynec. and Obstet., from Neurol. Zentralbl., xxxiv, 546, 1915) have operated upon 62 cases of gunshot injury of the brain during the past year, with 23 deaths. Among these 62 cases abscess was found at operation in 42. But there were a number of patients who apparently recovered perfectly from the operation, and yet who later developed abscesses and died. Six such cases are described. The abscesses generally developed 4 or 5 months after the operation; in 1 case the interval was 8 months.

The symptomatology of late abscess is quite characteristic. The patient shows a rise of temperature for awhile, and then suddenly general symptoms develop, such as headache, vomiting, and signs of beginning meningitis. There is apt to be an increase in already existing local symptoms, such as hemiplegia or aphasia. These phenomena are explained by the fact that the abscess has been strictly encapsulated for some time, but finally there has been propagation of the pus to the meninges through a small opening into one of the ventricles. Often when the abscess becomes manifest it is too late to save the patient by operation, but cases can often be saved by early operation.

From the foregoing it is evident that all cases of brain or skull wounds should be kept under careful observation for several months, and if there is a rise of temperature or the slightest sign of cerebral irritation the wound should be opened up. If there is pus, free incision and drainage are indicated.

Treatment, iii. 81.—According to P. Manasse (Münch. med. Woch., lxii, 1475, 1915), brain abscess may in great part be prevented by careful treatment of all head wounds. They should be opened up thoroughly and examined and any foreign bodies removed. The wound should then be filled with loose gauze and left open. Skull wounds should never be sutured, as there are almost certain to be late complications if they are. Subdural hematomata should be treated conservatively; an intact dura should not be opened unless there are urgent symptoms. If a brain abscess forms in spite of these precautions it should be opened up freely and the pus drained out, care being taken to reach all pockets and recesses. Drainage should be provided with loose gauze; never with rubber or glass tubes. The first dressing should be left 2 or 3 days and after that the wound dressed daily.

Barany (Münch. med. Woch., Jan. 26, 1915) invariably failed with suppuration following wounds in the brain until he found that a single narrow straight strip of rubber tissue drained better and gave better chances for healing when the head was kept up. The dressing should be applied with the patient seated, the pressure in the brain being then much lower unless the brain is actually swollen, which the change of position reveals if present.

One of the difficult things in the treatment of a brain abscess, according to H. P. Mosher (Trans. Amer. Otol. Soc., vol. xiv, part 1, 1916), is to find a drain that does not soon clog and cease to be of use. It is hard to keep an ordinary brain drain in place. A wire drain tends to catch in the granulations at the edge of the skin wound and holds in place almost too well, but the copper gauze allows the operator to bend the drain as he pleases. For insertion it is closed by a plunger. The natural shape of the drain is a cone. If the drain is kept clean it serves in a measure the purpose of an encephaloscope, as the brain substance or the wall of the abscess can be seen to a certain extent through the meshes of the wire gauze. In a case where there were 3 abscesses in the temporosphenoidal lobe the second abscess was located by pus welling up through the base of the front wall of the cone. Finally, if brain hernia threatens, counter pressure can be made against the protruding mass by slitting the side of the cone and turning the base back to make a collar. The wire drain then is a pliable instrument. The combined use of this drain and glycerine gives a brain drain which fills its object. His experience with it is, however, limited to 3 cases.

boric acid in, iii. 81
hydrogen dioxide in, v. 570
insufflation anesthesia in, iv. 686
trephining in, iii. 81
insanity due to, vii. 695
anemia, vi. 588
angiospasm.

In the opinion of W. Russell (Brit. Med. Jour., May 16, 1914), spasm of the cerebral vessels not only may occur, but is rather frequent. Transitory hemianopsia was associated in a personal case with marked reduction in the size of the vessels in the affected portion of the retina, return of vision being accompanied by relaxation of the spasm. The common conditions due to cerebral angiospasm are certain forms of migraine, transitory loss of memory, mental obscuration in which there are attacks of greater obscuration and inability to work, epileptoid attacks, vertigo, and temporary loss of ability to perform ordinary work. If the angiospasm recurs very frequently, or if an attack is considerably prolonged, more or less marked cerebral softening may result. Drugs which induce vasodilatation usually afford immediate relief.

compression, v. 190

Ransohoff (Lancet-Clinic, cxiii, 537, 1915) does not approve the modern tendency to decompress every cerebral injury. In 200 cases 37 per cent. of the fatal ones died within 6 hours or less, and 56 per cent. within the first 12 hours. He does not recall, except in one or two instances, where operation helped when the case seemed hopeless. Repeated lumbar punctures, however, are advised in these cases.

In those cases where consciousness is not lost, or there is a mild degree of coma and no grave intracranial trauma is indicated, operation is not advised unless pressure or distinct localizing symptoms supervene. Eighty per cent. recover without operation. In those showing increased pressure symptoms, however, decompression will save a considerable proportion.

Cranial decompression, according to Sharpe (Amer. Jour. Med. Sci., Apr., 1915), should be resorted to much more frequently than it is, especially in brain tumor, fracture of the skull, brain abscess and selected cases of spastic paralysis due to intracranial hemorrhage at birth. The subtemporal method of cranial decompression is the ideal route; besides being less difficult technically, it exposes an area of the brain most frequently involved. This permanent decompression opening does not weaken the skull, in that the thick overlying temporal muscles protect it most adequately, so that herniæ cerebri are not to be feared. Besides, the operative mortality is low.

C. A. Elsberg (Surg., Gynec. and Obstet., Aug., 1916) advocates conservation in fractures of the skull; definite signs of brain lesion or symptoms of increasing intracranial pressure alone warrant surgical interference. Excluding patients with depressed fractures or with large meningeal or subdural hemorrhages, he collected from his records 60 cases of skull fracture that either were not operated, or in which a decompressive operation had been performed. He excluded all those with gross lesions, whether depression of bone, laceration of the longitudinal or transverse sinus, and the like. Of the 60 cases of fractured skull 24, or 40 per cent. recovered without operation, although many required most careful watching. Fourteen, or 23 per cent., were moribund when admitted to the hospital and their condition never improved sufficiently to allow of an operation, even without anesthesia. Twenty-two were operated upon and a unilateral or bilateral subtemporal decompression was performed. Seventeen patients recovered and five died. The deaths in every instance were due to extensive and hopeless laceration of the brain.

concussion, v. 186; viii. 796

H. Aimé (Presse méd., Feb. 22, 1917) states that trench warfare has developed a serious and almost unvarying concussional syndrome. In 168 cases he established 6 different groups: 12 cases of mutism with or without deafness and with or without true auditory lesions. Most of the cases of uncomplicated mutism recovered spontaneously or under reeducation and reassuring words; 21 of painful concussion with frontal headache persisting for months, mental depression preventing sustained work, slight dizziness, unsteadiness in the standing position, and unilateral deafness, slowly recovered from; 17 cases of labyrinth concussion of all grades, from a simple dazed condition to marked ataxia and astasia abasia; 54 cases of the typical concussion syndrome, characterized by mydriasis persisting from two weeks to several months; exaggerated tendon reflexes persisting 3 days to 2 weeks; cutaneous hyperesthesia; marked vasomotor disturbances with acrocyanosis and paroxysmal sweating of the hands and feet, persisting for a number of weeks; apathy and aboulia for the first few days, followed by hypermotivity, pusillanimous fears, and sometimes irritability and a lachrymose tendency; interrupted sleep or insomnia; 47 cases of mental confusion, with lacunar amnesia, oneiric delirium and agitation, and cataleptiform attitudes, occurring especially in artists or professional men, and always in subjects showing evidences of former alcoholism or of functional defects in the abdominal organs or ductless glands; 17 cases of miscellaneous disturbance, such as persistent extrasystoles, localized and transitory paralyses, convulsions which would formerly have been qualified as hysterical, and a variety of sympathetic disturbances due to partial burial under masses of earth, including persistent meteorism, regurgitations, hiccough and aerophagia, sweats, loss of abdominal skin reflexes, constipation, attacks of enuresis, etc. In the asthenic type of case, **adrenalin** and **strychnine** were used in large doses with benefit, even in the cases with labyrinthine neuritis. **Dietetic** and **physical measures** proved useful in confusional states, sedative drugs being carefully avoided. Mutism was sometimes overcome, after a necessary period of watchful expectancy, by sudden, active stimulation of phonation by means of **inhalations** and of **ether** injections.

When a patient was totally unconscious for a time after the injury, owing usually to a fall on the head, or a wound of the skull from a bullet or scrap of shell, without actual lesions of the brain, according to Weber (Med. Klinik, Apr. 25, 1915), the symptoms that followed were usually headache, restless sleep, vertigo in climbing stairs or walking fast, inability to do any muscular work, and sweating. The concussion in such cases injures the central mechanism of vascular innervation; both the peripheral and the cerebral blood-vessels being involved. This is doubtless the cause of the headache and other symptoms which follow and persist after cerebral concussion.

Drugs afford no relief, but surprising benefit is derived from **alternating hot and cold douches.** At first the relief is transient, but permanent improvement follows after 2 or 3 weeks. The douches are given with hot and cold water for a half-minute each (14° and 45° C. or 59° and 113° F.) applying the cold jet a trifle longer than the hot, and ending always with the cold. The cold seems to be the active factor; its effect is merely enhanced by the hot jet. Seven cases are described.

absolute quiet in, v. 187
catheter, use of, in, v. 187
diet (liquid) in, v. 187
external heat in, v. 187
ice-bag on head, v. 187
prolonged rest in, v. 187
purgatives in, v. 187
sedatives in, v. 187
stimulants in, v. 187
congestion, see Hyperemia, vi. 588

Blum (Berl. klin. Woch., June 22, 1914), in congestion in the brain, suggests a constricting band at the root of the arms and legs, shutting off a large amount of venous blood without interfering materially with the arterial circulation and tiding the patient past the danger point.

apomorphine in, ii. 65
colocynth in, iii. 538
elaterium in, iv. 415
jalap in, vi. 91
leeching, vi. 314
mustard plaster in, iii. 676
contusion and laceration, v. 187

Having observed 397 cases in which a shell fragment had apparently merely bruised the scalp, Leriche (Lyon Chir., Sept., 1915) concludes that no matter how insignificant the superficial lesion may appear, every wound by a projectile should be incised and the bone examined. The dura, however, should never be incised if it is found intact, no matter how extensive the subjacent hematoma, contusion of the brain and immobility of the dura. If lumbar puncture shows high tension in the fluid, it should be taken as a criterion of deep seated lesions; but a high tension and an abnormal tint of the fluid reveal the existence of small foci of contusion of the brain which are not so much the work of the projectile as of the air concussion from the explosion of the shell.

antiseptic precautions in, v. 189
complete rest in, v. 189
edema, vi. 589
elevation of head in, v. 189
embolism, vi. 606
hot-water bags in, v. 189
incision of dura in, v. 189

Leriche (Lyon Chir., Sept., 1915) in 397 cases of skull contusions, found **lumbar puncture** a valuable aid in treatment of severe contusion of the brain or spinal cord from explosion of a shell or mine. The fluid keeps under high pressure for days and the patients exhibit paralytic phenomena or melancholia with stupor of Jacksonian epilepsy. Edema of the brain and small hemorrhagic foci were found on trephining, and lumbar puncture gave great relief as a rule.

purgatives in, v. 189
strychnine in, v. 189
trephining in, v. 189
embolism, vi. 606
endarteritis, **phosphorus** in, vii. 455
salvarsan in, iv. 214
hemorrhage, iii. 83

Diagnosis, iii. 96.—In a study of the serodiagnosis of cerebral hemorrhage, Marie and Leri (Bull. de l'Acad. de Méd., lxxviii, Nos. 21-22, 1914) found that certain *serums* were *greenish and more or less fluorescent* and that the serum always came from a patient with cerebral or meningeal hemorrhage. In 3 other patients with symptoms suggesting cerebral hemorrhage, but which proved to be softening of brain and no hemorrhage, there was no greenish tint to the serum.

Two cases reported by E. Macris (Grèce Méd., May 1-15, 1915) which disprove the assertion of Guillain and Vincent that meningeal hemorrhage always entails massive *albuminuria,* reaching its height in 24 to 48 hours, then disappearing completely. About 18 cases have been reported since in France sustaining their statement, but Macris's experience shows that there are exceptions.

Guillain (Presse méd., Nov. 8, 1915) answering Macris, states that the albuminuria to which he refers is of sudden onset, reaching 2, 10 or 20 Gm. per liter in 1 or 2 days after the meningeal hemorrhage, and then rapidly subsiding.

According to H. Kisch (Med. Klinik, Mar. 5, 1916), the particular type of individual in whom apoplexy is likely to occur is short, fat, has a very short neck, is decidedly plethoric, past 50 years of age, and usually over-indulgent in food. In 27 per cent. of 110 such persons, death resulted from cerebral hemorrhage, while there were only 4 per cent. of deaths from this cause among 700 obese individuals. In the apoplectic habitus the prodromal evidences of cerebral hemorrhage include long standing high blood-pressure; pulse of high tension; enlargement of the area of cardiac dullness; evidences of beginning sclerosis of the cerebral capillaries and renal vessels; and gastrointestinal disorders.

A. Gordon (Arch. of Internal Med., Mar., 1916), from a study of 5 personal cases of primary intraventricular hemorrhage—2 into both lateral ventricles and 3 into a single lateral ventricle—is led to consider a sudden onset without premonitory symptoms, profound coma continuing several days without improvement, absence of marked paralysis, absence of rigidity and contracture in the days following the seizure, and absence of the toe phenomenon, as indicative of this relatively uncommon form of cerebral hemorrhage.

Etiology, iii. 97.—F. Barlow (Med. Press, July 12, 1916) observed that the majority of seizures occur on Sunday or Monday, owing probably to the greater indulgence in the joys of the table on the day of rest and the slight increase in excitement consequent on the return to business. Total abstinence from alcohol confers no immunity on its votaries if they are big eaters and cocoa drinkers. Indeed, the fact is more obvious in cases of apoplexy, that sufferers dig their graves with their teeth, than in any other disease.

Pathology, iii. 102.—Pierre Marie and Léon-Kindberg (Presse méd., June 6, 1914) hold that complete and persistent coma in cerebral hemorrhage is not due to entrance of blood into the brain ventricles. From pathological studies they are convinced that in coma there must be a suspension of the functions of both cerebral hemispheres through compression by the blood, *i.e.,* the uninvolved, nonhemorrhagic hemisphere must be compressed against the unyielding cranium by the increased volume of the hemisphere in which hemorrhage has taken place.

Referring to the so-called "curable" meningeal hemorrhage in the young, Cordier, Lévy and Nové-Josserand (Annales de Méd., Aug., 1915) state that while the after-history of but few of the patients is known, a case in Cordier's experience suggests that the prognosis is graver than is generally assumed. The first meningeal hemorrhage proved to be the subarachnoid localization of a toxi-infection. This probably is the condition in all such cases hitherto regarded as spontaneous and curable. There is probably always some meningo-encephalitis, but the brain is affected so slightly that the symptoms from this escape attention. Sooner or later, however, the latent toxi-infection may flare up and the point of lessened resistance in the brain give way.

In 128 cases of intracerebral hemorrhage analyzed by Greenacre (Bull. Johns Hopkins Hosp., Feb., 1917), in 24 (about 18 per cent.) the brain showed discrete multiple hemorrhages, none of them being trau-

matic. Plurality of hemorrhages was represented in 3 brains by three distinct sites of hemorrhage, and in the remaining 22 by 2. The combination of 1 hemorrhage into the internal capsule or basal ganglia and 1 into the pons was most frequent, occurring in 15 brains (63 per cent.). Of the 7 brains (32 per cent.) in which both hemorrhages were into the cerebral hemispheres, 5 presented bilateral symmetrical hemorrhages implicating both internal capsules or basal ganglia.

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Two severe cases of submeningeal hemorrhage of the cord are reported by Podmaniczky (Berl. klin. Woch., Aug. 30, 1915), in which lumbar puncture not only led to the correct diagnosis, but caused a prompt and permanent recovery after other forms of treatment had failed after weeks of trial.

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Cerebrospinal fluid, tests of.

It was not until quite recently, according to A. L. Skoog (Trans. Amer. Med. Assoc.; N. Y. Med. Jour., June 23, 1917), that the source of the cerebrospinal fluid was ascribed to the cells of the choroid plexus gland. The normal pressure ranges from 100 to 150 millimeters in the sitting posture. The vast majority of *pathological pressures* are above normal. Brain tumors have the highest pressure, often ranging from 600 to 700 millimeters. In tubercular meningitis it is not quite so high.

According to A. M. Moody (Chicago Neurol. Soc.; Jour. Amer. Med. Assoc., Jan. 17, 1914), *Lange's colloidal gold test* is most valuable for diagnostic purposes. A series of ten test-tubes is used, 6 by ¾ inch in size. In the first, place 1.8 c.c. of a 0.4 per cent. sodium chloride solution, freshly made from a stock 10 per cent. solution, in one test-tube, and 1 c.c. in each of the other nine. Then take 0.2 c.c. of yeast and add to the first two. This is mixed with a 1 c.c. pipet. One c.c. is removed and added to the second tube, making a dilution in this tube of 1:20. This procedure is carried on throughout the series. When finished, there is 1 c.c. in each tube, varying from 1:10, 1:20, 1:40, and so on up to 1:5120 in the last tube. It is the making of the indicator that requires greatest care. When good, it is absolutely clear red, with some yellow and a tinge of purple.

The tests should stand for 24 hours that the maximum reaction may be secured; nevertheless, within from 15 to 30 minutes one can tell what the result will be. He divides the reaction into 3 groups: (1) the reactions which are strongest in dilutions of 1:40 and 1:80; (2) those having the maximum reaction in dilutions of 1:80, 1:60 and 1:1320; (3) those reactions which are strongest in dilutions of 1:640 up to 1:5120. Diseases of the brain and cord falling into the first class are those due to syphilis, namely, syphilitic meningitis, gumma of the brain, tabes dorsalis, general paresis and congenital syphilis. Tuberculous meningitis usually gives the strongest reaction. Brain tumor, toxic meningitis and edema from sunstroke may give a slight reaction of equal intensity.

In the author's work the Lange reaction runs parallel with the Nonne. It bears a close relationship to the Wassermann reaction.

As an index of pathologic change in the cerebrospinal fluid of children, Johnston (Amer. Jour. Dis. of Child., Aug., 1916) found that the colloidal gold reaction is more delicate than any other test employed.

The *colorimetric method* of determining the hydrogen ion concentration of the cerebrospinal fluid, according to Hurwitz and Tranter (Arch. of Internal Med., June, 1916), gives constant and reliable results.

R. G. Canti (Lancet, Feb. 12, 1916) pointed out that among the clinical cases of uremia, all those showing a *high urea content* in the spinal fiuid were fatal. Most of those with low urea content survived, and in several the diagnosis was found to have been erroneous.

Cerium oxalate, iii. 121

Cerium oxalate, according to R. W. Wilcox (Trans. Amer. Therap. Soc.; Med. Rec., Sept. 23, 1916), resembles bismuth subnitrate in its therapeutic action, with the advantage that it does not give rise to such an unpleasant odor to the breath, and that it is not so likely to be contaminated with arsenic. The therapeutic uses of cerium oxalate are very similar to those of bismuth, which are for local effect, and success requires doses of 10 grains (0.65 Gm.) every 4 hours. This dose should be frequently exceeded, up to 30 grains (2 Gm.).

Cerumen, inspissated, see Inspissated Cerumen, iv. 716; also this Index.

Cervical erosion, see Uterine Cervix, Erosions of, this Index.

gonorrhea, viii. 693; see also this Index.

rib.

Symptoms.—In reporting 7 cases, Plummer (Amer. Jour. Orthop. Surg., xiv, 146, 1916) states that the commonest clinical evidence of the presence of the extra rib has been a neural disturbance in the arm associated with pain, or pain and varying degrees of paralysis referable to the distribution of the ulnar nerve, and suggesting pressure on or injury to the eighth cervical root.

Muratori (Policlinico, June, Med. Sect., 1915), in 200 recorded cases of cervical ribs found them bilateral in 86, and more common on the left side. The deformity and functional disturbance impedes circulation and nervous conduction, hence the most varied symptoms. In a personal case neighboring muscles were defectively developed. As a rule, the disturbances do not become manifest until between 15 and 30.

Fearnsides and Sequeira (Proceed. Royal Soc. of Med., Apr., 1912) observed 2 cases of bilateral cervical rib associated with vascular disturbances resembling, at least in 1 case, those of Raynaud's disease. The second patient exhibited merely a purplish mottling on both upper arms and the inner aspects of the forearms and hands, unaccompanied by pain or uneasiness. The authors advise examination of the neck by radiography in doubtful cases of Raynaud's disease.

In a careful study of the original reports of 716 cases of cervical rib, Halsted (Jour. of Exper. Med., xxiv, 271, 1916) found that aneurism or dilatation of the subclavian artery was noted in 27, while in 6 the vessel was abnormally large.

Treatment.—For the excision of cervical ribs Bankart (Lancet, Apr. 5, 1913) makes an incision about 4 inches long parallel to, and about 1 inch from, the spinous processes of the vertebræ, with its center opposite to the seventh cervical. The trapezius is divided in the same line and retracted outward, to expose the deep muscles. The outer margin of the deep spinal muscles leads directly to the transverse processes, and so to the origin of the cervical rib. The rib is divided at once close to the vertebra, and, being then movable, can be dissected easily from the soft parts without danger of their injury. The trapezius is then sutured with catgut, and the wound closed without drainage.

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Chagres fever, see Malarial Fevers, v. 477; also this Index.

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Chalicosis, see Pneumonokoniosis, vi. 461

Chalk, see Calcium, ii. 710

Championnière's technique in hernia, v. 480

Chancre, viii. 452

H. N. Cole (Jour. Amer. Med. Assoc., Dec. 16, 1916) found that the primary syphilitic lesion occurred elsewhere than on the genitals in 60 of his cases. In 43 it occurred on the lips, 3 on the tonsils, and 1 on the tongue, making a total of oral lesions of 77 per cent. of the whole number of cases. In 10 the lesions occurred on the hands, 5 infections were due to bites of infected persons and 9 to kissing. A babe infected her father, he infected the mother and her un-

born child; 2 men with lip lesions infected their wives; and an infant infected its mother who in turn infected her husband.

Fromaget (Jour. de Méd. de Bordeaux, July, 1916) observed a hard chancre on the bulbar conjunctiva of a boy of 10; 2 other cases resembled in every respect the ordinary primary lesion of syphilis. The mere aspect reveals its nature and laboratory tests confirm it, but a pseudomembranous coating may cause doubt in some cases. The slow, gradual, painless development of the chancre excludes diphtheria.

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Chancroid, viii. 455, 700

F. Balzer (Paris méd., May 6, 1916) states that the application of **hot water** at a temperature of 45° C. or above, or prolonged irrigations with **hot 0.25 to 1:1000 potassium permanganate solution** often give excellent results; likewise the **thermocautery.** These methods are all inferior, however, to the use of a stream of **heated air,** supplied by one of the various forms of apparatus adapted to the purpose. Vaccine prepared from the Ducrey organism has not as yet given convincing results.

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Kraus and Barbara (Wiener klin. Woch., May 20, 1915) have ascertained that charcoal absorbs bacterial toxins both in the test tube and in the living body. Dysentery toxin, for instance, has its toxic properties nullified by the charcoal as effectually as by an antitoxin.

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Chelidonin.

Chelidonin is the alkaloid of Chelidoneum majus, which belongs to the *Papaveraceæ*. Its empirical formula, as given by Schmidt, is $C_{20}H_{19}NO_{51}$, and the most soluble salts are the phosphate and sulphate. In 1892, Meyer studied the general or systemic effects of chelidonin and found them to be closely similar to those of morphine, with the important difference that chelidonin produces practically no subsequent irritation of the central nervous system.

Hanzlik (Jour. of Pharmacol. and Exper. Therap., July, 1915) found that chelidonin promptly abolishes the spontaneous contractions of the following excised organs: Esophagus, fundus and pylorus of the frog's stomach, intestine of cat and rabbit, and pregnant uterus of guinea-pig. Chelidonin removes the effects of pilocarpin, pituitary extract, histamin and barium chloride on surviving organs. The peripheral blood vessels of the frog previously contracted by epinephrin are more rapidly dilated by chelidonin than by Ringer's solution alone. There is also a definite dilator effect on the untreated vessels.

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Diagnosis, iii. 125, 129.—C. P. Howard (Amer. Jour. Med. Sci., Nov., 1916) in 107 cases of chest wounds produced by rifle or machine gun bullets (45) or by shell as shrapnel, high explosive or hand grenade (42), found the symptoms were cough, pain, hemoptysis of varying degree, and dyspnea. There was usually fever The physical signs suggested consolidation rather than fluid, owing to the great compression of the lung. Cardiac displacement was often striking. In 8 cases there were unequivocal, and in 5 others suggestive signs of pneumothorax. In 4 cases pneumonia existed on the side opposite to the hemothorax. Secondary hemorrhage into the pleural cavity occurred in 1 case only. Simple fibrinous pericarditis occurred in 3 cases, and in 1 a pneumopericardium. Treatment consisted of free drainage in infected cases and of simple aspiration or of oxygen replacement. The mortality was only 7 per cent.

Piéry (Presse méd., June 3, 1915) in a study of 53 carefully followed cases of penetrating chest wounds in soldiers, found the symptoms strikingly constant, in 25 uncomplicated cases varying only in intensity and duration. Over the inferior third of the wounded lung, posteriorly, an area of dullness with resistance to the finger, loss of vocal resonance, and indistinctness or loss of breath sounds, were noted. Above this area was another of diminished resonance, with preserved or increased vocal resonance, but in particular, with distinct bronchial breathing at times slightly veiled. Fluoroscopic examination showed a shadow very dark below over the lower two-thirds of the lung, and exploratory puncture, an intrapleural accumulation of blood. *Hemoptysis,* the most characteristic functional sign, was present in 56.7 per cent. of the cases. *Primary* hemoptysis is carefully distinguished by Piéry from *secondary* hemoptysis, which sets in only on the second or third day and in which not fresh blood, but blood mixed with mucus and serum, is got rid of. Fever beginning 12 to 48 hours after the injury, persisting about two weeks, and then declining by lysis, was a striking feature, signifying a pneumonic process, more or less marked.

E. G. Beck (Interstate Med. Jour., xxiii, 259, 1916) emphasizes the value of stereoscopic radiograms in locating foreign bodies, also the fallacy of attempting to determine from a single radiogram the exact location of foreign bodies, and also that of attempting to form a correct view of the position of fragments after a fracture.

Prognosis.—Remond and Glénard (N. Y. Med. Jour., from Paris méd., Nov. 6, 1915) state that out of 110 cases of perforating wounds of the chest under observation in a military hospital for a period averaging 10 days, only 12 deaths took place. Six of these 12, moreover, had other wounds which compromised the issue. But little difference in mortality was noted between the cases in which a point of exit of the bullet or other missile was manifest and those in which the foreign body remained. Complications included protracted hemoptysis in 8 cases, hemopneumothorax in 25, empyema in 12, lung congestion and bronchopneumonia each in 5, friction rubs in 4, simple bronchitis in 3, and lung abscess with hernia in 1.

Treatment, iii. 125, 131.—Couteaud and Bellot (Bull. de l'Acad. de Méd., July 18, 1916) recommend **local anesthesia** for operations on the chest, having extracted a projectile from the lungs under it in 30 cases, and emphasize the ease and simplicity of the procedure. It affords better control of pneumothorax, while reducing the operative shock and disturbance to the minimum. They had no accidents nor mishaps. They flood the field of operation with a weak antiseptic solution, resect ribs and gain access to the lung without dread of operative pneumothorax.

Davies (Lancet, Jan. 29, 1916) emphasizes the advantage of having a manometer connected with the pleural cavity and of registering constantly the variations in intrapleural pressure, and of having means of controlling the same during operative interference on the closed chest.

Dupont and Troisier (Bull. et mém. de la Soc. méd. des hôp. de Paris, Nov. 27, 1914) report 3 cases of penetrating rifle bullet wounds of the thorax with hemoptysis, in which **emetine** was used with good results.

In the treatment Piéry (Presse méd., June 3, 1915) lays stress on decongestion of the lungs by means of **ipecac** and **digitalis,** to combat the oncoming hemorrhagic pneumonia. No attempt should be made to evacuate the hemothorax. Extraction of projectiles from the parietes should be delayed as long as practicable.

In 122 cases the importance of **early and prolonged immobilization** in treatment of wounds of the chest is urged by Maillet (Annales de Méd., Mar.-Apr., 1916). **Gelatin, calcium chloride** and other measures to check hemorrhages were supplemented by **emetine.** In 1 case **artificial pneumothorax** succeeded when all else had failed. These patients are particularly sensitive to getting chilled, and they develop serious congestion at the slightest exposure. **Quinine** was given in the cases with congestion.

When the effusion could not be tapped, injection into the pleural cavity of 10 c.c. (2½ drams) of a 5 per cent. solution of methylene blue aided in warding off suppuration.

Don (Brit. Med. Jour., June 10, 1916) recommends prompt treatment of chest wounds accompanied by marked and persistent bleeding. He makes a stab through an intercostal and slips the outer covering of a tracheotomy tube along the blade of the knife into the pleural cavity. Air enters and blood is coughed out. The tube is turned so that the inner end points up and is fixed by straps. The treatment has for its principle the production of a hemothorax, supplemented by drainage of the clot, which in military practice practically always becomes infected. The lung collapses quickly, and any wound in it immediately closes.

Burk (Deut. med. Woch., xlii, 134, 1916) considers that the operative method should be preferred to the use of the electromagnet for the extraction of portions of projectiles retained in wounds or cavities. In the trachea, esophagus, and intrathoracic regions, however, in which operation is difficult or impossible, extraction of the foreign body must be made generally by means of the electromagnet.

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Chloretone, iii. 217

M. A. Leavitt (New Eng. Med. Gaz., li, 248, 1916) advocates rectal anesthesia by means of chloretone for operations around the head, neck, and chest, where the element of fear is in evidence. He prepares the rectum by giving a cathartic the evening before, followed by enemata and suppositories of chloretone to anesthetize the rectal mucosa. Twenty minutes after the insertion of the chloretone, morphine and atropine are given hypodermically and 20 minutes later a mixture of oil and ether is introduced, in the proportion of 50 to 75 per cent. of ether and 50 to 25 per cent. of oil. One ounce (30 c.c.) of the mixture is given for every 20 pounds of body weight, not to exceed 8 ounces (240 c.c.), through a rectal tube at the rate of 1 ounce (30 c.c.) a minute. In from 10 to 55 minutes the patient goes to sleep. The length of the anesthesia varies from 2½ to 3 hours, but it may be shortened or lightened by withdrawal of the mixture through a rectal tube. After operation the bowels are massaged and cold water irrigations given to remove the oil and ether. Intravenous injections of normal saline solution may be given if the anesthesia is too deep.

Chlorhydric acid, see Hydrochloric Acid, v. 548
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of ethyl, see Ethyl Chloride, iv. 694
of lime, ii. 710
of mercury, vi. 653, 675
retention, calcium chloride in, ii. 719
Chlorides in the urine, estimation of.

Chlorides in Urine.—These consist chiefly of sodium chloride, with a small amount of potassium and ammonium chlorides. The healthy adult excretes from 10 to 16 grams of chlorides in 24 hours. The chlorides are *increased* normally, by increased ingestion of salt, by abundant drinking of water, and by active exercise; abnormally, in the first few days after the crisis of acute febrile diseases, gradually increasing as the disease abates; in diabetes insipidus; in dropsy after diuresis has been established. The chlorides are *decreased* normally during repose of the body; abnormally, in all acute febrile conditions (especially when attended by serous exudations) up to the crisis, when they may disappear entirely; in pneumonia their absence always indicates a serious condition; in diarrhea; in chronic conditions with impaired digestion and dropsy; during the formation of large exudations; in acute and chronic diseases of the kidneys with albuminuria; in chronic diseases. A decided diminution or absence of chlorides in a febrile condition is strongly suggestive of pneumonia.

Test for Chlorides.—Place 2 drams of the urine in a test-tube, acidify with 10 or 12 drops of nitric acid, C. P., and carefully add 1 drop of silver nitrate solution (1 to 8). If the amount of chlorides be about normal, this drop will form a whitish globule, a solid white ring or one or more compact, whitish, flocculent lumps, and will settle to the bottom. If the chlorides are diminished, there will be only some cloudiness. One may use a specimen of normal urine in another test-tube as a control. When the exact quantity of chlorides is desired, one must resort to quantitative titration, the technique of which may be found in larger treatises on Uranalysis.

Chlorinated lime, ii. 710

Chlorine.

This gas is recommended by J. I. H. Nelson (Brit. Med. Jour., Dec. 4, 1914) as a wash and dressing for septic and infected wounds. The solution was prepared by the action of concentrated hydrochloric acid on potassium chlorate, the gas being dissolved as it bubbled through the water, a proportion of 1 in 500 being thus obtained. This was used undiluted as a wash, diluted 3 times with water for dressings to prevent irritation, and diluted 5 times for a throat gargle and flesh wounds dressings, and still further diluted as a mouth wash in pyorrhea alveolaris. M. B. Halldorson (Jour.-Lancet, Oct. 15, 1916) found the U. S. P. solution useful in the early stages of tuberculosis and where the defensive functions prove deficient in infections.

Chloroform, iii. 221
  acetone-, see Chloretone, iii. 217
  and ether mixture, iii. 265
  and oxygen mixture, iii. 265
  anesthesia, iii. 229

Intratracheal Insufflation.—According to B. M. Ricketts (Med. Rec., Sept. 19, 1914), extensive laboratory experiments, verified by post-operative results, prove conclusively that so far as respiratory complications are concerned, *intratracheal insufflation* is an innocuous procedure, even in the presence of lobar pneumonia. Also, the recurrent air stream through the trachea precludes the possibility of aspirating vomited material or hemorrhage from the pharynx. A silk woven catheter 30 cm. long, and of a diameter one-half that of the glottis, serves as the best intubation tube. Its introduction is best accomplished after the induction of narcosis by ethyl chloride-ether or nitrous oxide-oxygen-ether.

Guisez (Bull. Acad. de méd. Par., lxxvi, 245, 1916) introduced a new method of anesthesia for operations upon the head and neck—*direct intubation*—in which it is possible, by means of a special tube introduced through the mouth and with the aid of direct laryngoscopy, to administer directly into the trachea a very exactly proportioned mixture of air and chloroform. It differs from the American method of insufflation in that both inspiration and expiration are done directly through the intralaryngeal tube.

Preliminary narcosis is induced by the mask in the ordinary way. The duration of the operations on the mouth and pharynx is greatly shortened. It obviates mechanical obstruction.

  alcohol in, iii. 252
  atropine in, iii. 245, 254
  blood-pressure in, ii. 500
  chloral hydrate preliminary to, iii. 210
  cocaine in, iii. 245, 254
  digitalis in, iii. 252
  epinephrin in, iii. 252
  ether in, iv. 666
  method of administration, iii. 243
  morphine in, iii. 245, 254
  nitrous oxide in, iv. 666
  quinine in, iii. 252
  sparteine in, iii. 245, 254
collapse of, iii. 250

G. Levy (Heart, vol. iv, No. 4, 1913) holds that under conditions of light chloroform anesthesia the ventricular irregularities may terminate in ventricular fibrillation and death of the heart: (*a*) As a reflex from sensory excitation. (*b*) As a result of an intermittent administration of the anesthetic. (*c*) From the nervous excitement accompanied by struggling induced in the earlier stages.

  adrenalin chloride in, iii. 257, 259

Gilman, Devine and Barber (So. Med. Jour., Oct., 1915) found experi-

mentally that the inhalation of amyl nitrite definitely increased the dose of the chloroform solution required to cause death in animals.

artificial respiration in, iii. 255, 259
atropine in, iii. 257
coffee infusion in, iii. 516
flagellations with wet cloth in, iii. 259
heart massage in, iii. 195, 196, 257, 258
inversion in, iii. 255
Locke's solution in, iii. 260
oxygen in, iii. 260; iv. 666; vii. 274
pituitary extract in, iii. 257
saline solution in, iii. 257, 259
strychnine in, vii. 145
traction of tongue in, iii. 259
venesection in, iii. 259
delayed poisoning, iii. 235

E. A. Graham (Jour. of Exper. Med., July, 1915) holds that the phenomena of late poisonings, edema, multiple hemorrhages, fat infiltration and necrosis are due to acids and to the fact that the amount of acid formed parallels the chemical dissociability of the drug outside of the body. Its main features are produced merely by the administration of hydrochloric acid, while the areas of central necrosis in the liver caused by various substances give an acid reaction to neutral red. Sodium carbonate in a hypertonic sodium chloride solution markedly inhibits the production of the lesions. The halogen acid (hydrochloric, hydrobromic or hydriodic acid), directly liberated in the process of dissociation, may be the pathogenic factor.

Opie and Alford (Jour. Amer. Med. Assoc., Mar. 21, 1914) found experimentally that fat administered to animals, and presumably stored in part in the liver, increased its susceptibility to the injurious action of chloroform. The liver cell fat evidently determines the fixation of chloroform and occurrence of necrosis. Carbohydrates, as also found by others, protect the body proteins from disintegration.

R. T. Lavake (Amer. Jour. of Obstet., Sept., 1916) agrees with Opie and Alford in believing that a high carbohydrate diet might be of marked value in pre-eclamptic toxemia. **Oxygen**, as advocated by Stroganoff, or treatment in the **open air** are rational.

sodium bicarbonate in, viii. 192
nausea and vomiting of, iii. 260

Renton (Brit. Med. Jour., Dec. 6, 1913) raises the head end of the bed on blocks 12 inches high in all cases after chloroform or ether anesthesia. This he continues for 24 or 36 hours. It results in a great diminution in the tendency to vomiting.

acetic acid in, i. 231
adrenalin in, iii. 260
albuminous water in, iii. 261
atropine in, iii. 260
ergot in, iii. 261
glucose in, iii. 261
hot applications to stomach in, iii. 261
ice-cold applications to stomach in, iii. 261
lavage in, iii. 261
lavage with solution of carbonate of soda in, iii. 260
light diet in prevention of, iii. 261
milk and lime water in, iii. 260
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morphine in prevention of, iii. 261
peptonized milk in prevention of, iii. 261
picrotoxin in, iii. 261
pituitrin in, iii. 260
saline solution in, iii. 261
scopolamine in prevention of, iii. 261
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veronal in prevention of, iii. 261
vinegar in, iii. 261
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anodyne, vii. 175
poisoning by ingestion of, iii. 261
artificial respiration in, iii. 262
olive oil lavage in, iii. 262
saline infusion in, iii. 262
warm sesame oil lavage in, iii. 262
withdrawal of blood in, iii. 262

Chloroma, see Leukemia, vi. 331, 335, 336
Chlorosis, iii. 266

Schmidt (Münch. med. Woch., June 16, 1914) recalled the fact that chlorosis is now believed to involve the entire organism, and to be actually a basic anomaly of the latter, which in turn almost necessarily implies a disturbance of the organs of internal secretion. In support of this he deems it significant that the serum from 18 girls with chlorosis regularly digested ovary and uterus tissue when the dialysis test was applied and did not digest other tissues.

aloes in, i. 570
arsenic in, ii. 150; iii. 273
arsenical water in, iii. 274
atoxyl in, ii. 261
betanaphthol in, iii. 274
barium chloride in, ii. 434
Blaud's pill in, iii. 272, 273
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bone-marrow in, i. 793
breathing exercises in, iii. 274
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copper sulphate in, iii. 645
diet in, iii. 272, vi. 77, 84
eggs in, iii. 274
fresh air in, iii. 272
green vegetables in, iii. 274
hot baths in, iii. 274
hydrochloric acid in, v. 555
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iron mineral waters in, iii. 274
lactic acid milk in, iii. 274
laxatives in, vi. 77, 84
manganese in, vi. 573
magnesium sulphate in, vi. 473
milk in, iii. 274
nitroglycerin in, vii. 55
orexin in, vii. 213
ovarian extract in, i. 788
potassium bitartrate in, vi. 473
quinine in, iii. 386
rain douche in, viii. 811
red meats in, iii. 274
rest in, iii. 272, 274; vi. 77
rhamnus purshiana in, vii. 822
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saline laxative in, iii. 274
silver nitrate in, viii. 135
sodium cacodylate in, ii. 701
spleen extract in, i. 795
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sulphur in, viii. 430
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indigestion of, menthol in, vi. 649
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Chlorophenol, vii. 445
Choked disk, see Optic Neuritis, vii. 205; also this Index.
in brain tumors, v. 199
Cholangiostomy, iii. 455
Cholangitis and cholecystitis, vi. 424
alcohol forbidden in, vi. 429
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Bier's hyperemia in, v. 595
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bismuth in, vi. 428
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Carlsbad salt in, vi. 428
cholecystectomy in, vi. 430
cholecystostomy in, vi. 430
cold water enemata in, vi. 429
diet in, vi. 429
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guaiacol carbonate in, vi. 428
hexamethylenamine in, vi. 429
hot water, copious use of, in, vi. 429
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methylene blue in, vi. 687
phenolphthalein in, vi. 429
resorcin in, vi. 428
rest (complete) in, vi. 429
salicylic acid in, vi. 429
saline laxatives in, vi. 428
saline solution in, vi. 429
sodium bicarbonate in, vi. 428
sodium oleate (acid) in, vi. 429
sodium phosphate in, vi. 428
surgical measures in, i. 97; vi. 429
vaccine therapy in, ii. 368, 372; vi. 429
Cholecystectomy, novocaine anesthesia in, vii. 103

In gall-bladder operations McArthur (Surg., Gynec. and Obstet., Jan., 1915) incises the posterior sheath parallel with the tendinous fibers of the transversalis, *i.e.,* nearly transversely. The level of incision is about an inch above the free end of the gall-bladder, a small opening being first made for confirmation of the diagnosis with the finger. The incision can then be enlarged to the middle line and laterally. The transversalis (posterior sheath) can, with the gloved fingers, be separated from the internal oblique with ease. After the gall-bladder procedures the cut edges of the transversalis can be whipped together with catgut sutures under absolutely no tension. The support given by the uncut transversalis renders tension stitches unnecessary and facilitates closure of the anterior sheath and skin.

Judd (Annals of Surg., Mar., 1915) makes his incision high and close to the midline, usually extending to the ensiform. Through such an incision much of the right lobe of the liver can be rolled out by using the gall-bladder as tractor. An important step in his technic is the complete freeing of the cystic duct before it is cut. Sometimes the author finds this difficult, but it can be done in practically every case.

Gall-stones being apparently the most common cause of recurrence or persistence of symptoms after operation, Deaver (Ills. Med. Jour., xxix, 419, 1916) lays great stress upon free and long continued drainage of either the gall-bladder or common duct or both in all operations upon the biliary passages. The use of maximum-sized tubes, allowed to remain until they practically fall out, has been his rule. He does not disturb adhesions when operating, unless they are in the way. As a rule they cause no trouble, and if disturbed, are sure to re-form, probably more densely.

Other possible causes of recurrent symptoms include: Late operation and extensive pathology; type of operation not adapted to the lesion; persistence or recurrence of infection; insufficient drainage; adhesions, especially of duodenum, pylorus or stomach; internal or external biliary fistula; contraction of the papilla of Vater; stricture of one of the ducts; chronic pancreatitis, pancreatic lymphangitis, and interstitial pancreatitis.

A stricture of the common duct with a normal gall-bladder and with a patulous cystic duct may be corrected by a cholecystoduodenostomy.

Cholecystenterostomy, i. 101; iii. 455

H. A. Shaw (Intern. Jour. of Surg., xxix, 211, 1916) holds that it is absolutely necessary to make sure that the cystic duct is competent before attempting cholecystenterostomy. The gall-bladder should not be too seriously pathologic. Anastomosis with the colon is dangerous. Anastomosis with the duodenum above the ampulla of Vater, though more difficult than with the jejunum by the retrocolic method, is ideal physiologically and is the method of choice in non-malignant conditions where a permanent stoma is considered, *i.e.,* in obstruction of the duct not removable by choledochotomy or stenosing injuries following choledochotomy. Anastomosis by the retrocolic method with the jejunum should be adopted wherever anastomosis with the duodenum is impossible through adhesions or other causes, and is the method of election in all malignant conditions. By either method it is essential to establish a liberal stoma. All added anastomoses are of doubtful utility. As in cholecystostomy or cholecystectomy, drainage of Morison's pouch is essential, with the added precaution of not allowing the drain to come in contact with the suture line.

Cholecystitis, vi. 424; see also Cholangitis, this Index.

Rosenow (Jour. of Infect. Dis., Oct., 1916) was able to produce experimentally marked lesions in the gall-bladders of his animals by means of streptococci and colon bacilli injected intravenously. The organisms used had been obtained from human gall-bladders. Of the animals injected, in 79 per cent. lesions of the gall-bladder developed. Definite formation of gall-stones was found in 6 rabbits and 3 dogs. He concludes that in addition to an infection furnishing the nucleus for the precipitation of the bile salts, it is necessary to have a concentrated bile of high cholesterinol content.

Paus (Norsk Mag. f. Laegevidenskaben, Jan., 1917) found that 20 per cent. of the patients with acute cholecystitis had a history of digestive disturbances, while 75 per cent. had had trouble with their gall-bladder before the one compelling operative measures. Pains were a prominent feature. There was vomiting in 31 per cent. of his cases, generally with no connection with the meals. In some cases the symptoms suggested ileus. There was no fever in some of his 20 cases, but as a rule the temperature ran up quite high and 22.5 per cent. had chills. The most characteristic sign is tenderness under the right costal arch. Jaundice was present in only 42 per cent. and was slight.

autogenous vaccine in, ii. 372
bacterial vaccines in, ii. 368
Bier's hyperemia in, v. 595
silver nitrate in, viii. 135
surgical measures in, i. 97

C. H. Mayo (N. Y. Med. Jour., Mar. 4, 1916) recommends the taking of **hot water before meals** as beneficial in cholecystitis. It starts the emptying of the gall-bladder and the flow of bile before food enters the stomach and gas formation begins, thus leaving the gall-bladder with a temporary reserve capacity within the limits of unconscious distension following the meal. **Cholecystostomy** (with removal of stones, if present) gives a high percentage of cure only if the infection has subsided or has been maintained by stones. **Cholecystectomy** with or without stones in diseased gall-bladders or existing cholecystitis gives a high percentage of cure.

In acute cholecystitis with pus, the gall-bladder being isolated from the general peritoneal cavity by omental adhesions, L. Frank (Surg., Gynec. and Obstet., xx, 360, 1915) carefully separates the omental wall sufficiently to give access to the gall-bladder for drainage, which is then rapidly carried out, disregarding stones. Calculi, if present, can be removed at a second operation. Cholecystectomy is bad practice in these cases. The author employs the anoci-association method, with gas-oxygen anesthesia.

acute, infectious, vi. 431
  abstinence from food in, vi. 431
  drainage in, vi. 432
  hot applications in, vi. 431
  prompt surgical treatment in, vi. 431
  removal of gall-bladder in, vi. 432
  removal of gall-stones in, vi. 432
  rest (absolute) in, vi. 431
  symptomatic treatment in, vi. 431
Cholecystostomy, **cocaine anesthesia** in, iii. 484

In the post-operative treatment after drainage of the gall-bladder, R. L. Rhodes (Surg., Gynec. and Obstet., Oct., 1916) keeps the patient prone and gives nothing by the mouth. **Proctoclysis**, using either water, dextrose, or sodium bicarbonate, separately or in combination, is practised and **morphine** ⅛ grain (0.008 Gm.) given every 3 hours if needful. In 77 cases the average duration of drainage was about 35 days. In 56 other cases in which **hexamethylenamine** 50 to 80 grains (3.25 to 5.20 Gm.) daily were added, it was about 29 days. The end-results were also more satisfactory. The hexamethylenamine was given by proctoclysis in the first week, then by mouth, being omitted 2 days in each week.

Retention of infected secretions in the crypts of Luschka in the wall of the gall-bladder, according to D. N. Eisendrath (Trans. Amer. Med. Assoc.; N. Y. Med. Jour., June 30, 1917), explains many cases of recurrence of infection and even true re-formation of calculi after cholecystostomy. Yet when stones are found in the common duct after drainage, one can never be certain that they were not overlooked at the first operation or had migrated downward from the liver. Special attention must be paid in the future to intrahepatic cholelithiasis. He strongly advocates cholecystectomy with removal of the cystic duct close to the common duct when many small calculi are found in the gall-bladder. A pseudo-gall-bladder containing calculi can be formed from the stump of the cystic duct if the latter is not completely removed. In a number of the writer's cases calculi were found in the main bile ducts when there were no definite symptoms of them and also when palpation of common duct was negative.

W. Wayne Babcock (Trans. Amer. Med. Assoc.; N. Y. Med. Jour., June 30, 1917) emphasizes the dangers of delay in operating in gall-bladder cases. The condition may be divided into 3 stages: 1, that of cholecystitis, occupying the 5 or 10 years preceding the operation, and which has hitherto been looked on with entirely too much indifference and complacence; 2, that in which stones are present but cause no complications in the ducts; 3, that of the terminal condition, *e.g.,* empyema of the gall-bladder, gangrene, pancreatitis, etc. In the first stage the treatment indicated is cholecystectomy, which is followed by practically no recurrences or secondary operations. The second stage cases should also be treated for the most part by cholecystectomy. In the first stage the operative mortality is less than 1 per cent., and in the second, 3 to 5 per cent. No cholecystostomies should be done in the first two stages, except in emergency cases, where the patient is in a bad condition at the time. In the older third stage patients seen 20 or 30 years from the beginning of their trouble, drainage of bile is likewise ineffectual, and cholecystostomy often does not result in the removal of residual stones.

Cholecystotomy, iii. 455, 456

Choledochotomy, i. 100

The dangers of drainage of the common duct are emphasized by G. W. Crile (Jour. Amer. Med. Assoc., May 2, 1914), who advises the immediate closure of the duct. Should there be complete occlusion, extraction of the stone may leave an occluded common duct; but even in that case, one had better close the common duct at once, and let the gall-bladder serve as drain until the lumen of the duct is again opened. The writer sutures the duct carefully with a curved round needle and a double row of fine chromic gut sutures. A piece of iodoform gauze was, in one case, sewed to an adhesion below and external to the suture-line but nowhere in contact with it, and the entire wound healed by first intention.

Writing on drainage of the common duct after cholecystectomy, Deaver (Annals of Surg., Apr., 1916) considers that drainage of this duct by way of the stump of the cystic duct is only a temporary procedure. When prolonged drainage of the common duct is needed, he opens the common duct and introduces a T-shaped rubber drainage tube. He has a number of patients wearing these tubes. This form of drainage is introduced in certain cases of pancreatic lymphangitis, and chronic interstitial and interacinar pancreatitis. Early drainage of the common duct by this method or by a cholecystoduodenostomy is the only chance for the cure of pancreatic diabetes.

Cholelithiasis, iii. 275

According to Boas (Surg., Gynec. and Obstet., May, 1916), there has been an enormous increase in the number of cases of cholelithiasis since the beginning of the war. This is due to the increased nervous strain involved. Married women are especially liable to gall-stone disease, and they are now especially subjected to worry.

Diagnosis, iii. 281.—In 9 per cent. of 1000 cases studied by F. Smithies (Trans. Amer. Med. Assoc.; N. Y. Med. Jour., June 9, 1917), the disease was malignant; in 434 cases there

was cholecystitis without gall-stones. A common lesion associated with gall-bladder disease was appendicitis. When stones occurred they did so at any stage of the infective process, large stones forming in as short a time as three weeks. Less than 8 per cent. of the patients were of obese type; 463 had lost considerable weight; 4 per cent. had chronic diarrhea, though most of them had good appetites. There was jaundice in only 161 cases where gall-stones were demonstrated later, and jaundice in 25 per cent. in which there were no gall-stones.

F. W. O'Brien (Boston Med. and Surg. Jour., Mar. 2, 1916), in a résumé of the recent literature, states that the consensus of opinion at present is that in at least 50 per cent, of the cases of gall-stone condition, the stones can be diagnosed by the X-ray.

- colic in, iii. 292
  - amyl valerate in, i. 624
  - atropine in, ii. 450
  - Bier's hyperemia in, v. 595
  - Carlsbad-Sprudel water in, iii. 292
  - chloroform in, iii. 264
  - hot cataplasma in, iii. 293
  - hot compresses in, viii. 814
  - hot water in, iii. 292
  - hot-water bag in, iii. 292
  - morphine in, iii. 292; vii. 188
  - narcophine in, vii. 177
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- intestinal obstruction in, v. 765
- medicinal treatment of, iii. 293
  - abundance of water in, iii. 299
  - aluminum silicate in, iii. 301
  - antipyrin in, iii. 294
  - aperient waters in, vi. 711
  - Bedford magnesia water in, iii. 295
  - belladonna in, iii. 294
  - Bier's hyperemia in, v. 595
  - bile acids in, i. 799
  - calcium creosote in, iii. 687
  - calomel in, vi. 678
  - Carlsbad in, iii. 296
  - Carlsbad-Sprudel water in, iii. 295
  - castor oil in, iii. 296
  - duodenal intubation in, iii. 300, 301

Cholelithiasis, medicinal treatment of (*continued*).

  - duodenal lavage in, iii. 300, 301
  - Durand drops in, iii. 293
  - enemata of Carlsbad-Sprudel in, iii. 300
  - enemata of olive oil in, iii. 293
  - glycerin in, iii. 293
  - hexamethylenamine in, iii. 294
  - hot compresses in, iii. 294
  - hot water in, iii. 299
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  - olive oil in, vii. 170
  - phenolphthalein in, vii. 447
  - rest in bed in, iii. 294
  - rhamnus purshiana in, vii. 822
  - Ringer's solution in, iii. 301
  - salicylic acid in, iii. 294
  - silver nitrate in, viii. 135
  - skimmed-milk diet in, iii. 294
  - sodium phosphate in, iii. 294
  - sodium salicylate in, iii. 293, 294
  - sodium sulphate in, iii. 294
- pancreatic opotherapy as diagnostic test in, vii. 299
- postoperative treatment, iii. 299
  - Bedford water in, iii. 299
  - Carlsbad waters in, iii. 299
  - diet in, iii. 299
  - sulphur waters in, iii. 299
- prophylactic treatment, iii. 292
  - Bedford water in, iii. 299
  - bile in, i. 798
  - Carlsbad-Sprudel water in, iii. 299
  - diet in, iii. 292
  - small meals in, iii. 292
- surgical treatment, i. 97; iii. 295, see also the various operations described in the preceding pages.

Lund (Surg., Gynec. and Obstet., Mar., 1917) sums the indications for cholecystectomy as follows: (1) in very thick, acutely inflamed, bright red or gangrenous gall-bladders due to impaction of a stone in the cystic duct; (2) in chronically thickened gall-bladders; (3) in gall-bladders much distended with clear fluid from impaction in the cystic duct; (4) whenever suspicion exists of malignant disease; (5) in chronic cholecystitis without stones, but with mod-

erate thickening and ulceration of the mucous membrane, giving little yellow spots on the mucous surfaces, the "strawberry gall-bladder"; (6) in chronic cholecystitis without stones but with adhesions to the surrounding organs, especially the pylorus; (7) all cases of gall-stones in which the operation is not for any reason unusually difficult or dangerous; (8) all cases of cholecystitis without stones where like conditions exist.

In 121 cholecystectomies performed since 1912, W. Wayne Babcock (Jour. Amer. Med. Assoc., Oct. 23, 1915) reports 2 deaths, a mortality of 1.6 per cent. In 42 cholecystostomies there were 4 deaths, or about 9 per cent. mortality. Before 1912, gangrenous and suppurating gall-bladders were usually removed; now they are usually drained under local anesthesia. The stage in which the operation is done exerts a great influence on the mortality. In 114 cases of cholecystectomy in the first stage, irrespective of date or technique, the mortality was 0.88 per cent. In 101 operations in the second stage, 67 being ostomies, there were 4 deaths, a mortality of 3.9 per cent.; after 54 operations in the third stage, there were 18 deaths in which the operation or biliary condition was a factor, a mortality of about 32 per cent. Thirty of these patients had acute gangrenous or suppurative cholecystitis, 7 an acute pancreatitis with fat necrosis.

According to J. B. Deaver (Surg., Gynec. and Obstet., Mar., 1917), the mortality difference in the 2 operations is as nothing compared to the mortality due to the local disease and general condition of the patient. One must eradicate the notion that gall-stones are the essential indications for surgery in cholecystic disease. Gall-stones are but a single sequel and by no means the most important one. Cholecystectomy in the average case will show an immediate mortality slightly in excess of cholecystostomy, but one *must* remove the gall-bladder which is the seat of hydrops or empyema, or when the cystic duct is strictured or contains an impacted stone. The strawberry gall-bladder must also be excised for permanent relief, likewise the greatly thickened or distorted gall-bladder, and the gangrenous or suppurating gall-bladder, unless the dangers of immediate removal contraindicate. In 41 cases of recurrence of symptoms the primary operation was cholecystostomy, and in 8, cholecystectomy. In 65 per cent. of recurrences after cholecystostomy the cause was traceable directly to failure to remove the gall-bladder.

The recurrences following cholecystectomy are related to thoroughness and care in operation. Drainage may convert unsuccessful cholecystectomies into successful ones. In the presence of jaundice and the absence of a markedly and macroscopically diseased gall-bladder cholecystostomy is the operation of choice.

Drainage for cholangitis by the way of the gall-bladder is much more simply made than drainage by the common duct. It is true that more adhesions are found after cholecystectomy than cholecystostomy in cases reoperated. Subsequent dilatation of the common duct and the stump of the cystic duct was not met by the author in over 1800 operations.

The writer inclines now to cholecystectomy when the gall-bladder is obviously diseased, this covering the vast majority of all cases. When the infection is more distinctively cholangitic and intrahepatic, as evidenced by minor appearances of inflammation of the gall-bladder with thickening, enlargement and a "streaky" appearance of the liver, or when the major lesion is in the pancreas or common duct, he prefers to leave the gall-bladder, using it either for internal drainage by cholecystoduodenostomy or for prolonged external drainage by cholecystostomy.

Stones in the common duct may frequently be overlooked, even after careful palpation has been made at the time of operation, according to

D. N. Eisendrath (Jour. Amer. Med. Assoc., Mar. 31, 1917). In his own experience calculi have been found at the lower end of the common duct in ⅓ of the cases in which palpation was negative.

- beta-eucaine infiltration anesthesia in, iv. 702
- cholecystectomy in, i. 97, 98; iii. 296, see also page , this Index.
- cholecystenterostomy in, i. 101, see also page , this Index.
- cholecystostomy in, i. 97, 98; iii. 295, see also page , this Index.
- cholecystotomy in, iii. 295, 296
- choledochotomy in, i. 100, see also page , this Index.

Cholemia, vi. 383
- Gilbert's familial, vi. 393

Cholera Asiatica, v. 719
- and hematuria, v. 398
- bacteriology of, v. 723, 725

On sugar free nutrient agar to which Teague and Travis (Jour. of Infect. Dis., June, 1916) added 1 per cent. saccharose, 0.25 per cent. nutrose and 0.0625 per cent. bluish eosin, the cholera colonies have red centers, while the colonies of *B. coli* are uniformly pink.

A. Castellani (Jour. of Trop. Med. and Hyg., Apr. 15, 1915) isolated from 2 cases of paracholera, and from the water of a well near which several cases had occurred, a vibrio which was biologically different from the true *V. cholera,* which he had formerly identified as *V. kegallensis Cast.* (1913). The probabilities are that it is the cause of paracholera, a cholera-like disease.

- blood-pressure in, ii. 498
- complement-fixation test in, v. 723
- prophylaxis, v. 727
  - aërated waters in, v. 728
  - alcohol barred in, v. 734
  - amidosulphonic acid in, v. 729
  - carbolic acid in, v. 728
  - destruction of vomitus, dejecta, urine, and infected clothing in, v. 727, 728
  - detection of carriers in, v. 728

Munson (Philippine Jour. of Sci., Jan., 1915) states that the recent outbreak in Manilla was spread chiefly by personal contact. Cases were isolated so promptly as to do little harm. Lack of the use of toilet paper, certain habits in the use of the toilet, infected fingers and eating with the hands food taken from a common dish were the channels through which the infection chiefly passed. Public water supplies and food could be eliminated, and flies played an entirely insignificant part in its spread. The 5-day period usually accepted for incubation and quarantine was not found to hold good in a very considerable number of instances.

The modern method for the control of Asiatic cholera on international trade routes is described by McLaughlin (Amer. Jour. Trop. Dis., iii, 392, 1916). Instead of being detained 5 days in quarantine, persons may be released upon a negative stool examination. This method, introduced by the writer, was made official July 19, 1911. *To detect carriers,* the following method is recommended: Specimens are obtained by administering a saline or by using a rectal tube with "eyes" cut into it. The specimen is then planted in peptone, incubated at 25° to 30° C. for 6 hours, and examined not later than 8 hours. A smear is made from the surface of the peptone growth, avoiding any pellicle. The smear is dried slowly and fixed with heat, stained with carbolfuchsin, and diluted 1 to 9. It is then examined for curved or vibrio forms. All positive or suspicious specimens are plated on ordinary nutrient agar (2 to 3 per cent.) neutral to phenolphthalein, the surface of which has been dried by an hour in the thermostat. These plates are examined after about 16 hours. Suspicious colonies are fished and mixed with specific cholera serum, 1 to 600, which should agglutinate true cholera at once.

  - digestive disorders guarded against in, v. 727
  - disinfection of dejecta by pixol in, viii. 503

Cholera Asiatica, prophylaxis (*continued*).
floors washed with permanganate in, v. 728
formaldehyde in, v. 728
gowns, use and care of, in, v. 728
infection of food and drink prevented in, v. 727
isolation of patients and carriers in, v. 727
lysol in, v. 728
mercury bichloride in, v. 728
milk and water boiled in, v. 727, 734
milk of lime in, v. 728
nitrate-containing food barred, v. 729
personal hygiene in, v. 727
polluted water avoided for washing utensils in, v. 727
potassium permanganate in, v. 728
protective inoculation (Haffkine's) in, v. 724, 734
sanitation in, v. 727
screens for rooms and works in, v. 728
sulphuric acid (dilute) in, v. 727; viii. 432
vaccine in, ii. 414

C. Dopter (Paris médical, Jan. 2, 1915) calls attention to the efficiency of anticholera vaccination in the Balkan wars. Whereas the incidence of cholera among 14,332 unvaccinated officers and enlisted men was 5.75 per cent., that among 21,216 men vaccinated once was but 3.12, and among 72,652 men vaccinated twice, 0.43, according to Arnaud. In the civil population of Greece, Cardamatis reported percentages of 2.12, 0.26, and 0.01, respectively. The vaccine used in these cases had been prepared at the Pasteur Institute in Paris and consisted of cultures on agar heated to 60° C. for 1 hour. The writer considers 3 injections at 5-day intervals essential if immunity is to be acquired. Doses of 1, 1.5, and 2 c.c. repectively, should be administered.

In the Hungarian army, Fejes (Deut. med. Woch., Apr. 6, 1916) found cholera inoculations much less efficacious than the typhoid. Aside from its undetermined protective power, it did not mitigate the course of the disease.

Cholera Asiatica, prophylaxis (*continued*).
wells to be disinfected in, v. 728
worry and fatigue to be avoided in, v. 734
tests for presence of, v. 724, 728
treatment of attack, v. 722
acetozone in, i. 243
adrenalin chloride in, v. 722

In an experimental study of the action of cholera endotoxins on the adrenals of rabbits, C. A. Demetrescu (Réunion Biol. de Bucharest, Dec. 17, 1914) found that it caused disappearance of their normal chromaffin staining reaction. Again, an extract prepared from the adrenals of animals injected with an emulsion of cholera vibrios killed at 60° were found to contain little or no adrenalin.

In keeping with the views of Sajous (1903-1907), Drake-Brockmann (1910), Plovesana (1912) and others, Naamé (Presse méd., Dec. 10, 1914) found a striking analogy between the cholera syndrome and the symptoms from defective functioning of the suprarenals. The remarkable tolerance of cholera patients for adrenalin shows, moreover, that it supplies a much needed active principle. He injected it subcutaneously in doses of 0.004 or 0.006 Gm. ($\frac{1}{15}$ or $\frac{1}{10}$ grain) in the 24 hours, keeping it up for several days, supplemented by saline infusion. Others have found it very efficient.

alcohol in, i. 509, 525
alcohol barred in, v. 722
ammonia in, i. 611
ammonium carbonate in, v. 722
ammonium valerate in, v. 732
atropine in, ii. 450; v. 730
barley-water in, v. 731
benzonaphthol in, v. 732, 733
blood-pressure in, ii. 498
caffeine in, v. 730, 731
calomel in, v. 731, 733; vi. 676
camphor in, v. 730, 733
cannabis Indica in, iii. 8
capsicum in, v. 730
carbonated beverages in, v. 729
castor oil in, v. 729
cerium oxalate in, v. 730, 731
chalk mixture in ii. 720
charcoal in, iii. 122

According to F. Groak (Wiener klin. Woch., Apr. 15, 1915), 30 cases of cholera treated solely with bolus alba gave a mortality of over 30 per cent. The treatment with animal charcoal aided by subcutaneous injections of hypertonic, 1.5 per cent., salt solution caused a decided change. Every cholera patient in whom the bacteriological diagnosis was positive received 5 Gm—1¼ drams—(a heaping teaspoonful) of animal charcoal 4 times daily. At first the entire dose was given at 1 time dissolved in 2 liters (quarts) of water. This, however, led to vomiting. It was then administered with cognac, being sipped at intervals of 10 minutes, in which manner it was well borne. The mortality under this form of treatment reached only 12 per cent. The patients received 1 to 2.5 liters (quarts) of hypertonic salt solution daily.

chloretone in, v. 731
chlorodyne in, v. 732
cocaine in, v. 730
coffee (hot black) in, v. 730, 731
cold baths in, v. 722
creolin in, v. 729, 732
creosote in, v. 730
diet in, v. 729, 730
digitalis in, v. 722, 730, 731
dry cups in, v. 722, 730, 731
epinephrin in, v. 734
ether in, v. 732
eucalyptus in, iv. 705; v. 730, 731
fasting in, v. 731
foot and body warmers in, v. 730
frictions in, v. 730, 731, 732, 733
ginger in, v. 730
heat to abdomen in, v. 729, 731
hot packs in, v. 731, 732
hot-water bottles in, v. 730, 732
hydrocyanic acid in, v. 732
hyoscyamus in, v. 730
ice in, v. 732
iced water in, v. 732
intraperitoneal saline injection in, v. 732, 733
intravenous saline infusion in, v. 729, 732, 734
iodine in, v. 733
iodoform in, v. 732
ipecac in, v. 731, 732, 733; vi. 61

Cholera Asiatica, treatment of attack (*continued*).
lactic acid in, vi. 242
lavage of bowel in, v. 729, 733
lead acetate in, vi. 313
lemonade in, v. 731
lemon juice in, v. 731, 732
magnesium sulphate in, v. 731
milk and soda (iced) in, v. 732
morphine in, v. 730, 731
naphthalin in, v. 733; vi. 785
nitrites in, v. 734
nitroglycerin in, v. 730
nitrous ether spirit in, v. 731
nux vomica in, v. 730; vii. 146
opium in, v. 722, 729, 730; vi. 313
oxygen inhalations in, v. 722
ozone in, vii. 278
pepsin in, v. 730
petroleum in, vii. 413
phenol in, v. 734
potassium permanganate in, v. 733

The results of the hypertonic and permanganate treatment in 1000 cases are given by L. Rogers (Lancet, July 31, 1915). The mortality was reduced from 59 per cent. in the decade from 1895-1905 to 25 per cent. during the years 1909-1915. The causes of death in the 25 per cent. of cases were uremia, often present in cases that had not been efficiently treated in the earlier stages; pneumonia, present in very severe cases; cardiac failure and exhaustion and collapse. He urges the value of the liberal use of sodium bicarbonate to reduce the proportion of uremic cases.

Preissnitz compress in, v. 733
quinine in, iii. 392; v. 729, 731
rest in bed in, v. 729, 732
saline enemata in, v. 722, 731, 732
saline injection (subcutaneous) in, v. 731, 732

Collapse, according to S. M. Cox (Lancet, July 1, 1916), is best treated by the intravenous injection of large amounts of salt solution. Experience has shown the writer that the best results can be secured by the initial administration of hypertonic saline until from 7 to 8 pints (3500 to 4000 c.c.) have been given, and then by continuation of the injection, using normal saline. The rate of injection should be slow—about 2 ounces (60 c.c.) a minute, and the saline should be continuously given until a rise of temperature to 103° F. (39.4° C.) or less, accompanied by a rigor, has been produced; then the injection should be continued until a total of 8 to 10 pints (4000 to 5000 c.c.) have been given, the rigor having come on usually after about 5 pints (2500 c.c.).

salol in, v. 732, 733
sal volatile in, v. 722
sinapisms in, v. 730, 731, 732, 733
soap liniment in, v. 733
sodium bicarbonate in, v. 731
sodium iodate in, v. 732
sodium phenolsulphonate in, vii. 447
sparteine in, v. 730
spermin in, i. 785
spiced plaster in, v. 729
starch enema in, vi. 313
strophanthin in, v. 732
sulphuric acid in, viii. 432
sumbul in, viii. 433
tannic acid in, v. 730; viii. 498
turpentine stupes in, v. 729, 731

During the campaign in Serbia Petrovitch (Jour. Amer. Med. Assoc., from Bull. de l'Acad. de Méd., Aug. 10, 1915) treated cholera patients with Wright's **anticholera vaccine** and vaccine from the Paris Institut Pasteur. Benefit was apparent in every single instance. In the 1153 mild cases all recovered except 2 patients debilitated by privations. None died of 90 cases of medium intensity, while the mortality was 9.4 per cent. in a similar group not given vaccine treatment. In the 157 cases of extremely severe cholera, the mortality was 14.4 per cent. while it was 58 per cent. in a corresponding group of 120 cases given the ordinary treatment. He diluted the vaccine 1:10 or 1:50 with physiologic salt solution; the dose was from 0.5 to 3 c.c. of this dilution. He repeated the dose 2 or 3 times or more during the day in the severer cases, and increased the amount of saline infused with the vaccine.

warm baths in, v. 730, 733
warmth in, v. 729, 730, 731, 732

Cholera Asiatica, treatment of attack (*continued*).
water in abundance (internally) in, v. 731
anuria in, **Fischer's solution** in, viii. 790
epidemic, see Cholera Asiatica, v. 719, also this Index.
infantum, iii. 302

With **albumin milk** properly given complete recovery may virtually be guaranteed, according to Langstein (Therap. Monats., Aug., 1915). The infant suffering from diarrhea and vomiting is given nothing but tea for from 12 to 24 hours, no longer, and then the albumin milk begun with 5 Gm. (75 minims) 10 times a day, with 3 per cent. of a maltose-dextrin mixture. The amount of albumin milk is increased by 50 Gm. (12½ drams) each day until the daily ration totals 300 Gm. (10 ounces). After the weight has become stationary, carbohydrates can be added up to 5 per cent. of the maltose-dextrin mixture. In a child over 3 months old, 1 or 2 per cent. flour or oatmeal can be added.

atropine in, ii. 447; iii. 305
baths in, iii. 305
bismuth in, iii. 304
brandy in, iii. 304
bromol in, vii. 445
calcium salicylate in, iii. 304
camphor in, ii. 732; iii. 305
camphor monobromate in, ii. 732
cool half-pack with heat to extremities in, iii. 305
ether in, iii. 305
friction in, iii. 305
glycerin in, iii. 305
hot mustard bath in, iii. 305
morphine in, iii. 305
nitroglycerin in, vii. 57
normal saline solution in, iii. 304, 306
phenol in, vii. 442
potassium bromide in, iii. 305
quinine in, iii. 392
resorcin in, vii. 809
sinapisms over stomach in, iii. 306
sodium bicarbonate solution in, iii. 304
sodium chloride solution in, iii. 304, 306
sodium salicylate in, iii. 305

Cholera infantum (*continued*).
    strychnine in, iii. 305
    warm bath in, iii. 305
    whisky in, iii. 304
  mixture, vii. 175
  morbus, v. 718
    abdominal binder in, v. 719
    acetic acid in, i. 231
    calumba in, ii. 722
    camphor in, ii. 731
    carbonated waters in, v. 719
    castor oil in, v. 719
    cataplasms in, v. 719
    Célestin Vichy in, v. 719
    creosote in, iii. 688
    diet in, v. 719
    hydrochloric acid in vomiting of, v. 556
    ipecac in, vi. 61
    morphine in, v. 719
    opium (camphorated tincture) in, ii. 733
    phenol in, vii. 442
    resorcin in, vii. 808
    rest in bed in, v. 719
    turpentine stupes in, v. 719
    veratrine in, v. 719
  nostras, see Cholera Morbus, v. 718
  sporadic, see Cholera Morbus, v. 718
Choleraic diarrhea, see Cholera Asiatica, v. 719; also this Index.
  diseases, copper sulphocarbolate in, iii. 645
Cholerine, see Cholera Asiatica, v. 719; also this Index.
Cholesteremia, vi. 383
Choluria, iii. 306
  Ehrlich's test in, iii. 307
  Gmelin's test in, iii. 306
  Huppert's test in, iii. 307
  Jolles's test in, iii. 307
  Pettenkofer's test in, iii. 307
  Smith-Maréchal test in, iii. 307
Chondroma of the mediastinum, viii. 551
  of the ribs and sternum, iii. 173
Chondrosarcomata, ii. 759
Chondrotomy, viii. 623
Chordee, camphor in, ii. 731
    cannabis Indica in, iii. 6
    chloral hydrate in, iii. 210
Chorditis nodosa, see Singers' Nodes, vi. 276, 295; also this Index.
  tuberosa, see Laryngitis, Chronic, vi. 260, 270; also this Index.
Chorea, ordinary or Sydenham's, iii. 308

Chorea, according to Isaac Abt (Med. Rec., June 24, 1916), is of infectious origin. In 143 of the hospital cases in which a special history of rheumatism was mentioned only 13 gave a definite history of articular rheumatism. The findings were similar regarding chorea and tonsillitis; only 45, or 33⅓ per cent., gave a history of tonsillitis. These records did not justify the assumption that there was any relation between chorea and acute infectious diseases. There was no question but that shock might bring on the symptoms of the disease. Of 226 cases, 73 showed cardiac affections, the majority being diagnosed as mitral.

Morse and Floyd (Amer. Jour. of Dis. of Children, July, 1916) practised lumbar puncture 20 times in 19 cases. The cerebrospinal fluid was perfectly clear in every instance. The pressure was apparently slightly increased in 1 instance. It had no noticeable effect on the symptoms.

An exhaustive anatomic study of a case of chronic progressive chorea led Pfeiffer (Amer. Jour. of Insanity, Jan., 1915) to conclude that the involuntary movements were probably due to a primary degeneration of the neurons in the nucleus ruber, the lateral nucleus of the optic thalamus and the lenticulate nucleus, thus interfering with the conductive integrity of the cerebello-thalamo-rubro-cortical path. The brain and spinal cord, including the motor cells were well preserved.

acetanilide in, i. 226
acetphenetidin in, i. 252
acetylsalicylic acid (aspirin) in, iii. 328, 329
ammonium bromide in, iii. 328
anthelmintics in, iii. 330
antipyrin in, ii. 43; iii. 321, 326, 327
antitoxin in, iii. 330
apomorphine in, ii. 67
arsenic in, ii. 141; iii. 321, 322, 323, 324, 325
arsenical waters in, vi. 712
aspirin in, ii. 220; iii. 328, 329
belladonna in, iii. 326
bismuth in, iii. 314

Chorea, ordinary or Sydenham's (*continued*).
- **blisters in**, iii. 676
- **brine baths in**, iii. 330
- **bromides in**, ii. 643
- **camphor monobromate in**, ii. 733
- **cannabis Indica in**, iii. 6
- **capsicum in**, iii. 323
- **cephalopin in**, i. 794
- **change of air in**, iii. 322
- **chloral in**, iii. 209, 328
- **chloralformamide in**, iii. 215
- **chloretone in**, iii. 326
- **chloroform water in**, iii. 323
- **cimicifuga in**, iii. 321, 345
- **cleansing of the mouth and pharynx in**, iii. 329
- **codeine in**, vii. 190
- **codliver oil in**, iii. 513
- **conium in**, iii. 550
- **country or seashore in**, iii. 321
- **diet in**, iii. 327, 330
- **dormiol in**, iv. 336
- **ergot in**, iii. 325
- **ether in**, iv. 692
- **ethyl bromide in**, iv. 694
- **Fowler's solution in**, iii. 323, 327, 328
- **fresh air in**, iii. 325
- **gelsemium in**, v. 18
- **hydrotherapy in**, iii. 321, 325, 327
- **hyoscine hydrobromide in**, iii. 327
- **iodine glycerole in**, vi. 7
- **iron in**, iii. 327
- **iron bromide in**, vi. 88
- **lobelia in**, vi. 436
- **Lugol's solution in**, iii. 328
- **magnesium sulphate in**, iii. 330

  Urdiates (Revista de Med. y Cirurgia Practicas, Dec. 14, 1916) obtained good results from a single injection subcutaneously of 15 c.c. (4 drams) of a 10 per cent. solution of the above salt.

- **male fern in**, iii. 331
- **massage in**, iii. 321
- **milk diet in**, iii. 327
- **moderation in study in**, iii. 320
- **modified rest cure in**, iii. 325
- **moist heat to stomach in**, iii. 314
- **nickel sulphate in**, vii. 43
- **open air in**, iii. 322
- **out-of-door exercise in**, iii. 321
- **parathyroid gland in**, i. 755; iii. 330
- **physostigma in**, vii. 459

Chorea, ordinary or Sydenham's (*continued*).
- **picrotoxin in**, vii. 463
- **pituitary gland in**, i. 782; iii. 330
- **potassium iodide in**, iii. 321, 328
- **psychic treatment in**, iii. 329
- **quinine in**, iii. 388
- **rest in**, iii. 314, 321, 325, 327
- **salicylates in**, iii. 328, 329
- **salophen in**, viii. 70
- **salvarsan in**, iv. 225
- **scopolamine in**, viii. 103
- **sedatives in**, iii. 325

  Faber (Calif. State Jour. of Med., Jan., 1917) recommends Goodman's treatment which consists in the injection, 1 to 4 times, of the **patient's own serum** into the spinal subdural space. Disappearance of the choreic movements, occurs frequently within 3 days, or even less, and a majority of cases remain permanently free of movements. Certain instances of recurrence are mild and readily amenable to another injection.

- **silver in**, viii. 136
- **silver nitrate in**, iii. 321
- **sodium bicarbonate in**, iii. 329
- **sodium bromide in**, iii. 314
- **sodium cacodylate in**, ii. 700, 704, 705; iii. 325
- **strychnine in**, iii. 321, 325
- **sulphonal in**, iii. 326; viii. 426
- **sunshine in**, iii. 325

  Haneborg (Norsk. Mag. f. Laegevedensk, Aug., 1916) connects the thymus gland with process as a result of the morbid effect of acute infectious diseases upon this organ. He found the **salicylates** followed by **thymus gland** especially efficient, the movements having been found to subside promptly after the latter had been given alone.

- **thyroid gland in**, iii. 330

  A. Archibald (St. Paul Med. Jour., Nov., 1914) reports 6 cases of chorea which gave a history of previous tonsillitis and 4 of rheumatism. Upon **removal of their tonsils**, uniformly favorable results were obtained. Not only was their general health markedly improved, but the choreic movements ceased and did not recur.

J. H. Young (Boston Med. and Surg. Jour., clxxiii, 356, 1915) holds that definite conclusions cannot be drawn from few cases; the occurrence of chorea after tonsillectomy in 12 out of 21 cases in the Children's Medical Department of the Massachusetts General Hospital indicates that removal of the tonsils does not protect against chorea or endocarditis.

  trional in, iii. 326, 327
  veronal in, viii. 808
  warm baths in, iii. 321
  zinc in, viii. 836
  zinc salts in, iii. 321, 326
associated with endocarditis, **sparteine** in, viii. 97
chronic adult, iii. 332
electrical, iii. 331
endemic, iii. 331
epidemic, iii. 331
festinans, iii. 331
gravidarum, **salvarsan** in, iv. 225

Ayres (Brazil-Medico, Mar. 22, 1915) connects chorea of pregnancy with some disturbance in the ductless glands. The mortality is always high and the prognosis grows graver when it is accompanied by mental disturbance. In one of his patients, aged 23, the choreic movements began almost from the first after conception. At the fourth month they had become so violent that she entered the hospital; the uterus was emptied after failure of all other treatment to relieve, and the chorea ceased at once. A year or 2 later she passed through a normal pregnancy without chorea.

Albrecht (Zeit. f. Geburtsh. u. Gynäk., lxxvi, 1915) reports a case of chorea commencing at the beginning of the first pregnancy. The case was treated by intragluteal injection of 20 c.c. **normal pregnancy serum.** In 24 hours the choreic movements had ceased. The writer believes that chorea is an intoxication in the pregnant patient by substances formed by the embryo, or in patients at puberty with substances produced by the ductless glands.

habit, iii. 332
hereditary, iii. 332

Chorea (*continued*).
Huntington's or hereditary chorea, iii. 332

Davenport and Muncy (Amer. Jour. of Insanity, Oct., 1916) in a study of 4 family complexes, found that 962 cases of Huntington's chorea could be traced back to some half-dozen persons, including 3 (probable) brothers who migrated to America during the 17th century. Among the 3000 odd relatives of the 962 choreics, many nervous traits are recorded—epilepsy 39 times, infantile convulsions 19 times, meningeal inflammations and brain fever 51 times, hydrocephaly 41 times, feeble-mindedness 72 times, Sydenham's chorea 11 times, and tics 9 times—mostly in one small family.

L. Grimberg (N. Y. Med. Jour., Jan. 27, 1917) reported a case which illustrates the hereditary nature of the disease. His patient presented the developed form of the disease, while the patient's father presented the *forme fruste.* Two of his sisters and 2 of his own children also showed the latter. One brother, 1 sister, and his daughter, on the other hand, showed the developed form of the disease as he did.

H. O. Waters having noticed that in 1 of his patients the movements ceased temporarily under the influence of all kinds of **instrumental music** except that from the common jew's-harp, Clarence King (N. Y. Med. Jour., Aug. 12, 1916) refers to a case in which the church organ had a remarkably quieting effect which lasted about an hour. He now reports another case in which the music of a violin had a quieting effect. It became a regular practice for a fellow patient to play a few strains of music before he attempted to eat his meals. It was not uncommon for him to throw himself from bed or nearly so unless soothed by music.

hysterical, iii. 331
induction of abortion in, i. 181
insaniens, iii. 312, 331
minor, **streptococcus vaccine** in, ii. 337

Chorea (*continued*).
  posthemiplegic, iii. 332
  procursive, iii. 331
  Sydenham's, iii. 308; see also Chorea, ordinary or Sydenham's, this Index.
Choriocarcinoma, i. 178
Chorioepithelioma, i. 178
Chorioretinitis, atrophic, mercury cyanide injections in, vi. 683
Choroid, atrophy, vi. 65
    mercury cyanide in, vi. 682
  coloboma of, vi. 62
  carcinoma of, vi. 69
  diseases of, vi. 61
  ossification of, vi. 69
  sarcoma of, vi. 69
    enucleation in, vi. 69
    iridectomy in, vi. 69
Choroiditis, vi. 65
    change of occupation in, vi. 66
    correcting lenses in, vi. 66
    iodides in, vi. 66
    mercury in, vi. 66
    outdoor life in, vi. 66
    rest in, vi. 66
    tonics in, vi. 66
  central, vi. 65
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Comby (Arch. de Méd. des Enfants, Mar., 1917) observed a delicate girl of 14 who had had leucorrhea for years, whose sweat had a disagreeable pungent odor. Her underclothing in the axillæ became discolored with blackish stains as if stained with ink. It seemed to be of the nature of choroid pigment. The writer has also encountered a case of yellow chromidrosis. Chromidrosis is always regional, may be blue, red or black, yellow or green, and is evidently due to some chromogen in the sweat which on oxidation by the air becomes colored.

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The question of the toxicity of various alcohols in the production of cirrhosis is still a mooted point. In reporting a case in a boy of 9 years Satre (Progrès méd., Mar. 3, 1917) reviews the present state of our knowledge on this subject. Alcoholism and scarlet fever seem to be mainly responsible, but measles and tuberculosis are not infrequent causes. The fibrous tissue develops so rapidly in children that the portal system does not have time to adapt itself to the cirrhosis, and consequently symptoms become manifest almost from the first.

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Max Einhorn (Trans. Assoc. Amer. Phys.; Med. Rec., Aug. 12, 1916) terms "gastrohydrorrhea" the flow of a watery fluid from the stomach containing neither hydrochloric acid nor rennet or pepsin ferments. One to 1½ quarts (liters) a day occurred in a patient suffering from cirrhosis of the liver accompanied by a pyloric stenosis. No ascites had developed. At autopsy a typical cirrhotic liver and a pyloric tumor (cancerous) were found.

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Lenoble (Bull. de l'Acad. de méd., Nov. 7, 1916) imprisons a little air in the test tube with the blood (Hayem's hematimeter). On tilting the tube the air moves around, like the drop of fluid in a spirit level, as long as the blood is fluid. The moment the blood begins to coagulate, the bubble of air is immobilized.

P. E. Weil (Presse méd., Apr. 12, 1917) holds that the physician should inquire as to the personal and family history in respect to hemophilia and thrombosis, with examination of the skin for traces of extravasation, phlebitis, etc., and test the coagulating time. When the tests show excessive coagulability of the blood, thrombosis menaces, and ether and chloroform should be avoided as they injure the blood and may bring on thrombosis. In such a case blood-serum should never be injected, and it must be remembered that losses of blood enhance the coagulating power of the blood. The blood can be rendered less coagulable by citric acid. Chantemesse prescribes it in the daily dose of 12 to 18 Gm. (3 to 4½ drams) diluted in water. Sodium citrate might answer the purpose. Subcutaneous injections of saline or glucose isotonic physiologic solution might be useful, or a 47 per 1000 solution of sugar by the drip method.

strontium lactate to improve, viii. 408
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Coagulen.

This coagulating substance extracted from the blood-platelets by Kocher and Fonio was found by Vogt (Deut. med. Woch., June 25, 1914) particularly effective for checking all varieties of hemorrhage except that from large arteries. It was applied either as an injection into the region of the bleeding vessels or on tampons or pads of gauze. A 10 per cent. solution in water was prepared fresh and sterilized by boiling. Intravenous injections were of value in uterine bleeding.

Halpern (Beitr. z. klin. Chir., Bd. 95, Hft. 2, 1915) found coagulen a valuable hemostatic in bleeding carcinomata and post-operative hemorrhages. It is harmless and prompt. It has proven especially valuable in a number of war injuries. In several cases of amputation of fingers, toes, and legs, ligation was dispensed with entirely.

Coaguloviscosimeter, v. 420
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-miners' disease, see Pneumonokoniosis, vi. 461; also this Index.
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Coast fever, see Malarial Fevers, vi. 477; also this Index.
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Cocaine, iii. 467
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Virden (Amer. Jour. of Surg., Aug., 1915) says that he never failed to secure anesthesia with a small amount of the solution after boiling it. Also there have been no undesirable effects, such as irritation of the cornea or conjunctiva, and the healing of surgical wounds has not been interfered with in any way.

Aikins (Canad. Pract. and Rev., xli, 96, 1916) emphasizes anew the fact that adrenalin and cocaine must be used with very great care and discrimination. They should be applied at least 1 hour before the induction of general anesthesia. Many authors are quoted who have observed sudden death follow the injection of cocaine-adrenalin solutions during a chloroform anesthesia. It produces ventricular fibrillation.

Physiological action, iii. 470.—Kuroda (Jour. of Pharm. and Exper. Therap., Nov., 1915), after studying the physiological effects of cocaine, concludes that it first increases the activity of unstriated muscle and then depresses it, whatever be the nature of sympathetic control. He ascribes the dilatation of the pupil caused by cocaine to a direct action on the muscle of the iris.

Pettey (So. Med. Jour., Apr., 1914) found cocaine the most prompt and efficient of all respiratory stimulants. He gives ½ grain (0.03 Gm.) hypodermically, repeating the dose as required. Two illustrative cases are cited: one of alcoholism with threatened respiratory failure and semicomatose for 2 days; the other was a case of acute paraldehyde poisoning whose breathing had been reduced to 6 to 8 per minute.

habit, see Cocainomania, iii. 501; also this Index.
poisoning, acute, iii. 475

Prevention and treatment of acute cocaine poisoning, iii. 477.—Herzfeld (Zentralbl. f. Chir., xl, 1705, 1913) observed repeatedly from minimal doses of cocaine (Schleich's infiltration narcosis), mild symptoms of poisoning. Dentists have had a large number of deaths from this. He gives every patient, without exception, 25 to 50 c.c. (6¼ to 12½ drams) of **whisky** or **cognac**, by the mouth, before the first injection of cocaine. In long-continued operations he repeats the dose, mixing the whisky with sugar water in women and children. In the course of the last 4 years, he has not had the slightest trouble from local anesthesia with cocaine.

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Cocainomania, poisoning, chronic, iii. 501

C. G. Steinmetz, Jr. (Jour. Amer. Med. Assoc., Apr. 10, 1915) observed a series of 15 cases in which the habit had been acquired by men employed where the drug was manufactured. The ages of the men ranged from 23 to 40 years, and the daily quantity taken, from 20 to 60 grains (1.3 to 4 Gm.). The method of taking was solely by snuffing, it probably being the most convenient.

According to Vasoin (Gaz. degli Osped. e delle Clin., Mar. 7, 1915) there is no need to "taper off" unless the patient is much debilitated, or has heart disease or severe kidney disease. The serious symptoms following sudden stoppage of the cocaine soon pass away, but there may be serious disturbances in the functioning of the bladder, heart and digestive organs, for a time, and the addict can scarcely ever hope to regain entirely his former physical and mental health. The writer cites a case published by Marfan in which 2 of the 4 children in the family had been born after the father had become addicted to cocaine, and both these children were idiots, one of these hydrocephalic. The oldest child was bright and healthy; the second child was conceived when the addiction had first commenced, and this child was mentally sound but of feeble constitution.

McGuire and Lichtenstein (Med. Rec., July 29, 1916), after a study of about 12,000 cases in the city prison, conclude that the treatment of such cases cannot be carried out except in a hospital or sanatorium. The gradual reduction method, so called, as practised by physicians outside of hospitals is condemned as useless.

The constant use of cocaine upon a mucous membrane, according to Ridpath (Laryngoscope, Jan., 1916), produces congestion and tumefaction, followed by atrophy and anemia; but the sensibility of the mucous membranes is not affected. Catarrhal affections are less prevalent than in non-users of the drugs. Heroine produces a thin, acrid discharge, and cocaine causes epistaxis.

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Severe chronic coffee poisoning is characterized, according to Roch (Arch. des Mal. du Coeur, Jan., 1916), by emaciation, premature wrinkles, a yellow complexion, tremor of the hands, lips, and tongue. The eyes are bright and quick; mydriasis is the rule; the demeanor is hesitating, brusque or uncertain, with involuntary movements, exaggeration of reflexes and neuralgias. This picture is very seldom complete, but nervous and digestive symptoms are comparatively common, and functional cardiovascular disturbance is still more frequent and important. The author has found the pulse small, hard and rapid, the arterial pressure high. The effects of chronic coffee poisoning may suggest gastric cancer, neurasthenia, or Basedow's disease.

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  cat, see Hyperesthetic Rhinitis, v. 600; also this Index.
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  dust, see Hyperesthetic Rhinitis, v. 600; also this Index.
  fever, see Malarial Fevers, vi. 477; also this Index.
  horse, see Hyperesthetic Rhinitis, v. 600; also this Index.
  June, see Hyperesthetic Rhinitis, vi. 600; also this Index.
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Colectomy, i. 88

Lane (Brit. Med. Jour., Apr., 1915), states that in colectomy the chief object is first to separate the evolutionary adhesions from the mesentery. The outer peritoneal aspects of the mesenteries should be left smooth and intact. In ligaturing vessels, inclusion of large masses of mesentery should be avoided, and subsequently all ligatured points should be rendered as inconspicuous as possible.

The ileum is divided usually within a few inches of its termination. The longer the small bowel remaining, the greater the increase in weight after colectomy; in stout patients shortening of the small intestine is of material advantage. The pelvic colon is drawn up from the pelvis and grasped with forceps about 2 inches above the level of the pelvic brim, and the end of the ileum attached directly to the cut end of the pelvic colon. The innermost row of sutures perforates all the coats of the bowel, and is of the button-hole type, while the outer rows secure only the peritoneal and muscular coats. Difficulty in anastomosis because of the difference in caliber is met by arranging the sutures so that each picks up a correspondingly greater portion of the circumference of the pelvic colon than of the ileum. Finally, the cut edges of the mesentery of the ileum and pelvic colon are sutured together, care being taken to leave no raw surface. An esophageal tube is introduced through the rectum and ileocolic junction.

Summarizing the final results of total colectomy for constipation, J. G. Clark (Surg., Gynec. and Obstet., May, 1916) observes that in only 6 of 12 cases operated on could the result be considered entirely satisfactory. In all cases there was great improvement in the constipation for a time, to be followed in 4 by a gradual recurrence of the constipation, though in some cases not as severe as before. In no case was there diarrhea of long standing, nor undue thirst. In 6 cases there was marked improvement in nutrition. On the whole, total colectomy is justifiable only in severe cases of obstructive constipation. The colectomy should be limited to the ascending colon and the middle of the transverse colon, with lateral anastomosis of the ileum into the transverse colon.

In carefully selected patients with stasis who are toxic from their condition, Mayo (Jour. Amer. Med. Assoc., Sept. 9, 1916) deems right-sided colectomy, with preservation of the omentum, justifiable. It gives as good results as general colectomy and has less primary and secondary danger. There is great variation in the length and size of the human intestine. The shortest, 8 feet, is the carnivorous type; the longest, 33 feet, the herbivorous type. End-to-end union of ileum to colon is a safe procedure. The closed end of the large bowel, being incorporated into the wound and brought through the peritoneum, into but not through the muscle, may be opened to serve as a gas vent should the necessity arise. In most cases constipation is improved, but the best results follow operations of necessity for tumor and obstruction. Among 262 resections of the large intestine for malignancy, 54 per cent. of those who recovered were alive after 5 years, and 67.5 per cent. after three years. Among 235 cases in which the right half of the colon was resected for tumors, disease and stasis, the operative mortality was 12.5 per cent.

Coley's fluid, iii. 532
- modified Bassini operation in hernia, v. 471, 472, 475, 480
- technique in umbilical hernia, v. 488

Colic, abdominal, **anhalonium Lewinii** in, i. 700
  - **capsicum** in, iii. 15
  - **ether** in, iv. 692
  - **hyoscyamine** in, v. 580
  - **mentha** in, vi. 648
  - **mercury bichloride** in, vi. 680
  - **mustard** in, vi. 774
  - **opium tincture** in, vii. 189
  - **pepper poultice** in, vii. 361
  - **picrotoxin** in, vii. 463
  - **spice plaster** in, iii. 396; viii. 837
  - **thyme, oil of,** in, viii. 533
  - **turpentine** in, viii. 634
- arteriosclerotic, **diuretin** in, iv. 334
- biliary, see Cholelithiasis, iii. 275; also this Index.
- flatulent, **cajuput oil** in, ii. 709
  - of infants, **camphor** in, ii. 731
- hepatic, see Colic under Cholelithiasis, iii. 292, also this Index.
- infantile, **asafetida** in, vi. 473

Colic, infantile (*continued*).
dormiol in, iv. 336
juniper in, vi. 174
magnesium carbonate in, vi. 473
magnesium oxide in, vi. 473
morphine in, vii. 189
opium tincture in, vi. 473
intestinal, **atropine** in, ii. 450
lead, **belladonna** in, ii. 447
recurring.

Küttner (Berl. klin. Woch., Jan. 26, 1914) holds that recurring disturbances, and also periodical vomiting and transient disturbances in micturition, are due to mischief in the appendix, which often manifests itself first at the umbilicus, not only in children, but also in adults. It is usually of a mechanical nature, the appendix being either abnormally long, twisted or kinked, occasionally or permanently, or it may contract spasmodically. The permanent cure after removal of the appendix is the best testimony to the connection between them, and the writer describes 6 typical cases, including his own children, in which this favorable result was obtained.

renal, vi. 195; also Renal Colic, this Index.
uterine, **atropine** in, ii. 450
Colitis, see also Intestinal Catarrh, v. 706; also this Index.
creolin in, iii. 690
mucomembranous, see Colitis, Mucous, v. 699; also this Index.
mucous, v. 699

J. W. Preston (Jour. Amer. Med. Assoc., Nov. 27, 1915) observed 3 cases of mucous colitis which were relieved by **removing dental and nasopharyngeal foci**, calling for operation.

In mucomembranous colitis Capparoni (Policlinico, Nov. 5, 1916) holds that **milk, fruit and fresh vegetables** must be **prohibited**, as also everything tending to increase the uremia, to which there is usually a tendency in these cases. Among the local measures are **enemas**, taken reclining, of a 1:1000 solution of salicylic acid, or a teaspoonful of **ammoniacal ichthyol** to a liter of water. Dyspepsia should be combated by small doses of **alkalies** 10 minutes before meals. **Castor oil** is the only purgative permissible, in a dose of 15 Gm. (3¾ drams) with a little **belladonna**. Iodide and **arsenic** may be indicated if there is a lymphatic tendency. The nervous disturbances may call for 0.05 Gm. (⅚ grain) **phosphorus** in 50 Gm. (1⅔ ounces) **olive oil**, injecting 2 c.c. (32 minims) daily, keeping this up for 3 months with intermissions of a month.

agar-agar in, v. 704
appendectomy in, v. 705
appendicostomy in, v. 705
belladonna in, v. 704
calomel in, v. 704
calumba-agar in, v. 705
castor-oil in, v. 704, 779
colon bacillus vaccine in, ii. 372
diet in, v. 703, 704, 705
enemas in, v. 704, 705
exercise in, v. 705
formalin in, v. 705
gelatin in, v. 16
glucose in, v. 705
hazeline in, v. 705
hot-water bottle in, v. 704, 705
hydrastis in, v. 545
ileosigmoidostomy in, v. 704, 705
irrigation of colon in, v. 705
krameria in, vi. 237
lysol in, viii. 503
magnesium sulphate in, v. 704
mineral waters in, v. 705
morphine in, v. 704
olive oil in, v. 705; vii. 171
pancreatin in, vii. 299
petrolatum (liquid) in, v. 705
phenyl salicylate in, v. 779
regular meals in, v. 703
rest in, v. 703
saline solution in, v. 705
silver nitrate in, v. 705; viii. 135
sulphur baths in, v. 705
tar (crude) in, v. 704
Tivoli douche in, v. 705
von Noorden's method in, v. 703
warm clothing in, v. 705
zinc chloride in, v. 705
zinc sulphate in, v. 705
peri-.

Pericolitis, an inflammation of the covering of the colon, with exudation, may result from appendicitis; Jackson's membrane, a thin film covering the ascending colon; Lane kink, duodenal and gastric ulcers, sigmoiditis, wandering kidney, cholecystitis, ileocecal tuberculosis, actinomycosis and inflammation of Meckel's diverticulum.

Wanner (Revue méd. de la Suisse Romande, Apr., 1914) tabulates the symptoms of pericolitis in their order of frequency, as follows: 1. Attacks of abdominal pain, of very short duration or persisting at most for 1 or 2 days. 2. More or less marked pain in the right side of the abdomen, especially near the lower costal margin and in the ileocecal region. 3. Obstinate constipation, with copious evacuations at intervals. 4. Progressive loss of weight in three-fourths of the cases. 5. Vomiting or nausea, repeated at short intervals. 6. Fever. There may be added anorexia, coated tongue, nervousness, mucous stools, flatulence, tenderness and impaired resonance of the cecal region, and dilatation of the cecum, colon, and sometimes of the stomach.

F. G. Connell (Surg., Gynec. and Obstet., xix, 742, 1914) reviews 19 cases of pericolitis and ileal kink in which the appendix had been previously removed. The primary result was favorable, but the symptoms returned after variable periods.

ulcerative, v. 750

In 4 cases of ulcerative colitis recorded by Carlson (Hygiea, lxxviii, No. 4, 1916), severe suppurative colitis, which had been debilitating them for months or years, was cured by **opening the colon at the sigmoid flexure with supplementary appendicostomy** in all but 1.

appendectomy in, v. 751
appendicostomy in, v. 752
bismuth subgallate in, v. 751, 752
boric acid in, v. 751, 752
colostomy (right inguinal) in, v. 752
enemas in, v. 751, 752
gelatin in, v. 752
gum arabic in, v. 751
high rectal injections in, v. 752
hydrastis in, v. 545

Colitis, ulcerative (*continued*).
hydrogen dioxide in, v. 752
iodine and iodides in, vi. 44
iodoform in, v. 751
potassium permanganate in, v. 752
silver solution in, v. 752
starch in, v. 752
sulphur in, v. 751
zinc chloride in, v. 752

Collapse.

Etiology.—In a study of collapse following naval engagements, Ehret (Münch. med. Woch., Dec. 1, 1914) states that it may be due either to disturbance of the action of the heart, the blood-vessels, or of the kidneys. The last is seldom seen in the cases under consideration. Collapse due to cardiac disturbance occurs when too great a demand is made on the reserve power of the heart.

Treatment.—Prophylactically, according to Ehret, **morphine** may be administered, especially if pain is severe. The patient should **lie flat.** The **diet** should be fluid or partly solid. The treatment of the actual collapse consists in administration of **cardiac stimulants** either hypodermically or intravenously. **Caffeine** and **camphor** are best given at the outset. Later **strophanthus** and **digitalis** may be given, but the heart muscle must be in good condition. **Adrenalin** in 10- to 20- minim (0.6 to 1.2 c.c.) doses mixed with physiological **salt solution** is of great benefit in collapse following pneumonia.

adrenalin in, i. 764
alcohol in, i. 525
ammonia in, i. 610
atropine in, ii. 450
blood-pressure in, ii. 499
caffeine in, iii. 524
camphorated oil injections in, ii. 729
digitalis in, iv. 157
ether in, iv. 691
light therapy in, vi. 364
strychnine in, vii. 136, 145

hypotension in, ii. 499
adrenalin in, ii. 499
cocaine in, ii. 499
digitalis in, ii. 499
saline solution and adrenalin in, ii. 499
strychnine in, ii. 499

Collapse (*continued*).
of anesthesia, coffee infusion in, iii. 516. See also Chloroform, iii. 221 and Ether, iv. 636; and this Index.
threatened, after childbirth, pituitrin in, i. 778
Collargol, iii. 534

Vest (Bull. Johns Hopkins Hosp., Mar., 1914) referring to collargol pyelography, states that the pain may be quite severe, lasting for 2 or 3 days, and once for 10 days. There may be a definite rise in temperature, 102° F. (38.9° C.) having been reported in 2 cases and 104° F. (40° C.) in another. He urges that collargol should be used only when absolutely necessary. It should be allowed to run into the renal pelvis in small amounts and under very low pressure. A freshly prepared solution, not over 15 per cent. should be employed, but on account of the dangers of collargol some other medium should be sought which will give a shadow but not injure the renal substance. Silver iodide emulsion may prove preferable.

Small intravenous injections of collargol are recommended by Gellhaus (Münch. med. Woch., lxiii, 191, 1916) in infective diseases. The strength should not exceed 1 per cent. and in the case of children 0.5 per cent. He has used it in 143 cases of different types: appendicitis, peritonitis, gonorrhea, pneumonia, etc. Good results are obtained when collargol is injected in the early stages.

Colles's fracture, iv. 774, 776
Colliquative diarrhea, nitric acid in, vii. 45
sweats, formaldehyde in, iv. 736
Collodion, iii. 535
blistering, see Cantharides, iii. 9
Colloidal copper, iii. 646
Coloboma lentis, iii. 709
of choroid, vi. 62
of eyelid, see Eyelids, Coloboma of, iv. 726
of iris, vi. 62
Colocynth, iii. 536
poisoning, iii. 537
apomorphine in, iii. 537
atropine sulphate in, iii. 537
bismuth subnitrate in, iii. 537
Colocynth poisoning (*continued*).
cocaine hydrochloride in, iii. 537
demulcents in, iii. 537
fomentations to epigastrium and abdomen in, iii. 537
lime water in, iii. 537
morphine in, iii. 537
stimulants in, iii. 537
zinc sulphate in, iii. 537
Cologne spirit, see Methyl Alcohol Poisoning, vi. 683
Colon anastomosis.

Axial or end-to-end anastomosis of the colon has not hitherto been popular because of the high mortality it has seemed to entail. P. Lockhart-Mummery (Surg., Gynec. and Obstet., Feb., 1917) points out that the real reason why axial union often failed is that the arteries supplying the colon pass round in a circular direction with very little anastomosis. Leakage after axial union is generally on the side opposite to the mesentery. All that is necessary to secure a good result in axial anastomosis is to cut the bowel across at an angle of 45 degrees from the mesentery outward, *i.e.*, with more bowel removed on the free than the attached side, thus insuring a good blood-supply to the whole of the sutured edges. The writer has used this method for years, with almost uniformly perfect results. With the resected portion of bowel a wedge of mesentery is removed. The bowels are moved on the second day by a small gruel enema, assisted, if necessary by pituitary extract.

bacilluria, bacterial vaccines in, ii. 367, 371
-bacillus nephritis in abdominal surgery, i. 14
hexamethylenamine in, i. 15
sodium benzoate in, i. 15
enuresis of, hyoscyamus in, v. 579
exclusion of.

Excellent end results are reported by Von Beck (Beitr. z. klin. Chir., lxxxiv, 338, 1913) from colon exclusion by ileosigmoidostomy in tuberculous involvement, even extensive, of the lower ileum, cecum, and colon.

G. G. Turner (Brit. Med. Jour., iv, 227, 1916) warns against operations on the intestinal tract in which no outlet is provided for the intestinal mucous secretion. This oversight sometimes leads to fatal results. When stimulated into greater activity by irrigation or infection, the amount of secretion may be enormous, as in colitis, and even result fatally.

R. Smith (Surg., Gynec. and Obstet., Nov., 1916) considers that where a patient with toxemia only from the small bowel becomes a surgical case, Lane short circuit—ileocolostomy—is the operation of choice, but if, as is usually the case, the obstructed ileum is accompanied by a dilated and atonic cecum, the Mayo right-sided colectomy is the proper operation. The Mayo technique is free from the criticism of the Lane technique, in that the intestines are not handled after the colon has been opened, greatly lessening the possibility of infection, and there is no blind pocket left to become impacted.

C. A. L. Reed (Trans. Amer. Med. Assoc.; N. Y. Med. Jour., June 30, 1917) asserts that actual colectomy must be abandoned as impracticable because of late unpleasant complications. Even after simple ileosigmoidostomy, pronounced anastalsis supervenes, aggravating the toxemia. In what the writer terms physiological colectomy, after the ileosigmoidostomy with side to side anastomosis has been established, the sigmoid is divided in its upper arch as near as practicable to the lower end of the distal sigmoid. The open end of the distal segment is then fixed in the lower angle of the wound and the open end of the proximal colon in the upper angle. Finally, a catheter —afferent—is inserted into the open terminal ileum, the tip being carried into the cecum, and a large tube—efferent—into the open end of the colon. Thus isolated, the colon is irrigated to unload its toxic fecal content and then left to atrophy from disuse. Where a secondary actual extirpation becomes necessary, the difficulties are diminished owing to the atrophy of the colon. The primary mortality from physiological colectomy should be practically *nil*, though as yet the percentage of ultimate recoveries have not been entirely satisfactory.

inversion of.

R. T. Morris (N. Y. Med. Jour., May 13, 1916) practises longitudinal inversion of the colon, leaving room enough simply for the passage of mucus. A short circuit between the cecum or lower ileum and the sigmoid colon is first made. A silk or linen mattress suture is then carried between 2 lines of longitudinal muscles of the colon so as to invert its wall and retain it folded-in. To prevent pouching tissues between longitudinal muscle bands, an accordion suture is used, traversing 2 or more protruding colonic pockets and then brought back upon itself to compress them. This suture, introduced rapidly just beneath the peritoneum or through the muscle coat, also shortens the bowel. The procedure is not practical for patients with a fat, heavy omentum or large epiploic appendages; but patients with chronic colonic toxemia are usually thin. In cases in which this method was used the colon was apparently held by the sutures.

tumors of.

In acute obstruction, primary resection, according to W. J. Mayo (Jour. So. Car. Med Assoc., xii, 165, 1916), should never be done; colostomy being the procedure of choice and later, resection performed. The most important technical feature is free mobilization of the tumor mass and adjacent bowel. For this purpose there is no danger in dividing the outer leaf of the mesentery. Involvement of nearby organs is not a contraindication, as they may be resected or removed *in toto*. In the large intestine he uses end-to-end anastomosis and for a union of large to small bowel an end-to-side method. In the end-to-end variety, at least 1 of the segments should be well surrounded by peritoneum. If marked obstruction and distention are present the 3-stage operation of Mikulicz is recommended. If there is danger of leakage from the anastomosis he suspends it beneath the incision with a slight rubber drain down to the gut to allow free drainage. In low sigmoid and rectosigmoid tumors the tube method of resection of Balfour is efficient and safe.

wounds of.

Even a grazing wound of the abdominal wall, according to Stassen and Voncken (Paris méd., Dec. 18, 1916) may cause contusion of the intestinal wall with sloughing, and a fecal phlegmon may quickly follow. Prompt mechanical cleaning out of the region will ward this off, but the symptoms may simulate those of more serious injuries. Disappearance of dullness over the liver as a diagnostic sign of intestinal perforation, may occur with extraperitoneal wounds of the colon.

Colonial spirits, see Methyl Alcohol Poisoning, vi. 683
Coloptosis, see Visceroptosis, v. 770; also this Index.
Color-blindness, iii. 538
  santonin in, viii. 72
 -index of the blood, v. 373
 of the blood, v. 369
Colored sweat, see Chromidrosis, viii. 447
Combined posterolateral sclerosis, see Ataxic Paraplegia, viii. 248
Colostomy, i. 76

As a substitute for the distressing colostomy, McArdle (Pract., June, 1916) employs one of the following procedures: (1) Sigmoid above the stricture joined to the sound lower part of rectum; (2) if sigmoid fixed, transverse colon, if low, anastomosed to the rectum and to the descending colon above stricture; (3) cecum joined to rectum and the ileum to colon above stricture; (4) lowest coil of ileum joined to the rectum and by a lateral anastomosis to the descending colon above the obstruction.

In the upper opening the small female end of a Hildebrand button is inserted and fixed with a purse-string suture. With special forceps the larger male end is passed through the rectum and made to project upward, so that a small incision may be made over the central part, which then protrudes, allowing the bowel wall to slide down so close to the spring that no suture is needed. The 2 halves of the button are then clamped. The result is a passage for fecal matter into the rectum instead of outward on the abdomen.

  cocaine anesthesia in, iii. 484
  diet after, i. 81
  subgallate of bismuth after, i. 81
  tincture of opium after, i. 81
 Gant's technique, i. 77
 Lilienthal's technique, i. 80
Colpitis, alumnol in, i. 591
Columbia spirits, see Methyl Alcohol Poisoning, vi. 683
Coma.

Bissell and LeCount (Jour. Amer. Med. Assoc., Mar. 27, 1915) analyze 200 cases in which death from coma occurred. Of 26 mistaken diagnoses of cerebral hemorrhage, uremia was the clinician's conclusion in 61.5 per cent. of these errors.

  ergot in, iv. 571
 diabetic, iv. 27, see also Diabetes, this Index.
Comedo, see Acne, i. 256; also this Index.
Compensatory emphysema, see Emphysema, Pulmonary, iv. 453; also this Index.
Complement, v. 386
 -fixation test in cholera Asiatica, v. 723
 in chronic pulmonary tuberculosis, viii. 608
Compound fractures, see Fractures, Compound, iv. 753; also this Index.
 tar elixir, vii. 176
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 of nerves, viii. 254

Concussion of the spinal cord, see Traumatic Neuroses, viii. 794
Condurango, iii. 549
Condyle fractures, iv. 770, 771
Condylomata, see Verrucæ, viii. 168; also this Index.
Congenital alopecia, i. 571; see also Alopecia, this Index.
  amaurosis, i. 595
  aneurism, i. 665
  atelectasis, see Atelectasis, Congenital, vii. 21
  dilatation of esophagus, iv. 600
  fistula of the ear, iv. 711
  hernia, v. 449, 455, 485
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  angiomata of, ii. 516; iii. 587
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    atropine in, iii. 596
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    cherry-laurel water in, iii. 596
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    dionin in, iii. 596
    flooding of eye in, iii. 596
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    mineral acid solution in lime burns, iii. 596
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    boric acid wash in, iii. 551
    dark glasses in, iii. 551
  inflammation of, iii. 551; see also Conjunctivitis, this Index.
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  tuberculous disease of, iii. 582

In a series of cases of ocular tuberculous manifestations excellent results were obtained by R. B. Metz (Cleveland Med. Jour., Sept., 1916) from the use of **tuberculin** in graded doses. It caused apparent cure or marked improvement in 5 cases, including 2 of phlyctenular conjunctivitis.

    cautery in, iii. 583
    curette in, iii. 583, 584
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    boric acid in, iii. 580
    hot-water compresses in, iii. 579
    mercury bichloride in, iii. 580
    potassium chlorate in, iii. 580
    purgatives in, iii. 579
    sodium chloride in, iii. 580
  diphtheritic, iii. 580

In the case of a child of 2 whose left eyelids were swollen and hard, and the under surface was covered with false membranes, observed by DaRocha (Brazil Medico, July 8, 1916), nothing but staphylococci could be grown from the latter or the nasal secretions. Two days later, however, the child's condition grew worse and diphtheria bacilli were then found in pure cultures. **Antitoxin** was then injected in small doses, 3 c.c. on alternate days, to ward off any tendency to anaphylaxis, and recovery was soon complete. The other eye stayed normal.

    antitoxin in, iii. 581, 582
    atropine in, iii. 580, 581
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    pilocarpine in, iii. 581
    potassium permanganate in, iii. 580, 581
    quinine in, iii. 680
    silver nitrate in, iii. 580; viii. 139
    sodium thiosulphate in, iii. 581
  eczematosa, see Conjunctivitis, Phlyctenular, iii. 575; also this Index.
  follicular, iii. 556
    aristol insufflations in, iii. 556
    atropine in, iii. 556
    calomel insufflations in, iii. 556
    expression of follicles in, iii. 556
    iodoform insufflations in, iii. 556
  gonorrheal, see Ophthalmia, Gonorrheal, iii. 559; also this Index.
  granular (Trachoma), iii. 565

Distribution, iii. 565.—Anna Williams (Jour. of Infect. Dis., Mar., 1914), did not, among the children of 60 public schools in the crowded lower East Side of New York city find any cases of conjunctival affections answering in their entirety to the classic descriptions of trachoma.

King (Public Health Reports, Dec. 18, 1914), in examination of 4000 children of Porto Rican schools, found 9.5 per cent. suffering from trachoma, and classed 5.4 per cent. more as "suspicious." The writer favors "exclusion from the schools or segregation of all trachomatous pupils."

Prophylaxis, iii. 571.—The Annual Report of the Surgeon General of the United States Public Health Service (Med. Rec., Mar. 18, 1916) states that the best solution of the trachoma problem has been found to be the establishment of small hospitals for the treatment of the disease in localities in which it is prevalent; and that the service, therefore, now maintains five trachoma hospitals in the three States of Kentucky, Virginia, and West Virginia. In the past fiscal year 12,000 cases of the disease were treated, and in addition the hospitals have been used as centers for educational work. In Kentucky, of 18,016 people examined, 7 per cent. were found to be suffering from trachoma.

alum in, i. 584; iii. 571
atropine in, iii. 571, 574
bichloride solutions in, iii. 571

According to M. B. Beals (N. Y. Med. Jour., Nov. 13, 1915), the usual routine treatment of trachoma by copper sulphate, tannic glyceride, argyrol, etc., has shown but poor results when applied to the thousands of school children on the records of the Health Department of New York. The intense **bichloride rub**, however, combined with the treatment indicated to modify the intense reaction which often follows the first few applications, is so far superior to the other methods that it should supersede them in nearly all cases. It leaves no scar tissue.

boric acid in, ii. 585; iii. 571
canthoplasty in, iii. 572
carbon-dioxide snow crayon in, vii. 787

The treatment of trachoma with **carbon dioxide snow** is described by Galetti (N. Y. Med. Jour., from Revue de thérap. médico-chir., Jan. 15, 1914), who found it more rapid in action and less annoying to the patient than other measures. The applications are made after local analgesia by a 3 per cent. solution of cocaine. At each sitting 5 or 6 applications can be made to different points on the everted upper lid, and 3 or 4 to the lower lid, spaces being left between the several points.

cocaine in, iii. 572, 573
copper sulphate in, iii. 571-574, 644
copper sulphate glycerite in, iii. 573
curettage in, iii. 573
electrolysis in, iii. 572
excision of conjunctival folds in, iii. 572
expression of granulations in, iii. 572
glycerin in, iii. 575
good ventilation in, iii. 574
hydrastinine in, v. 547
hydrogen dioxide in, v. 573
ice-compresses in, iii. 572, 573
iodine in, vi. 38

The results of treatment of trachoma with **iodic acid** obtained in the Military Hospital in Krakau, where this method of treatment has replaced all others since 1906, are given by Josef Rudas (N. Y. Med. Jour., from Arch. of Ophthal., Sept., 1913). The iodic acid is moistened until it forms a plastic mass which is rolled into a rod. For comparison 583 cases thus treated were compared with 553 cases treated by other methods. The average length of treatment was 44.12 days in the former, and 64.47 in the latter. Ulcer and pannus occurred in 0.85 per cent. of the former, in 3.25 per cent. of the latter. Disturbances of vision were 0.51 per cent. in the former, 3.07 per cent. in the latter. Relapses occurred more rarely after treatment with iodic acid, with a difference of 8 per cent. The eye is **cocainized**, the iodic acid rod is applied to the lower transition fold, which is then wiped dry with cotton and the superfluous iodic acid washed off with 3 per cent. **boric acid solution.** The upper lid is then everted and an application made in the same manner; the lid is then doubly everted with a forceps, and the upper transition fold cauterized in the same way. After cauterization the follicles should appear yellow. Pain begins as soon as the effect of the cocaine wears off and varies in severity. A

violent inflammation ensues, but after this passes off, the conjunctiva presents a clean wound surface. Symblepharon must be guarded against.

jequirity in, iii. 574; vi. 93, 94
Kuhnt's procedure in, iii. 572

Dimitry (N. O. Med. and Surg. Jour., Dec., 1915) advocates tarsal massage, particularly the improved technique of Vessius and Kuhnt. The writer employs a metal or glass rod about 8 inches in length and about ¼ inch in diameter. One end of it is smoothly rolled with cotton for about 2 inches and moistened in a normal salt, boric acid or boroglyceride solution, or better, one of 1:5000 bichloride. This is used to thoroughly flood the conjunctival folds, dilating the pupil and completely cocainizing the conjunctiva. The lid is then turned over. The cotton-tipped end of the rod is inserted under the tarsus and deep into the retrotarsal folds; pressure is made upward and the lid is rolled. The thumb that holds the lid over is pressed down upon it, producing undulations in the tarsus. The contents of the follicles are now pressed out, making the tarsus pliable. Great care must be used against injuring the cornea. The rolling is performed every other day.

mercuric oxide ointment in, iii. 572
mercury cyanide injections in, vi. 683
nourishing food in, iii. 574
olive oil in, iii. 575
perfect cleanliness in, iii. 574
peritomy in, iii. 575
radium in, iii. 574
salicylic acid in, iii. 573
scarification in, iii. 573
silver nitrate in, iii. 571, 573; viii. 138
sodium salicylate in, iii. 574
surgical procedures in, iii. 572

The results of surgical removal of the tarsal cartilage and palpebral conjunctiva in 402 cases of trachoma are given by D. W. White and P. C. White (Ophthalmology, Oct., 1915), who contend that the efficiency of this operation seems to be known to but few. In most of their cases where recovery occurred, vision had been reduced to counting fingers.

tannin in, iii. 571
vaselin in, iii. 571, 575
yellow oxide ointment in, iii. 573
zinc in, iii. 571
cicatricial contractions of the eyelids due to, thiosinamine in, viii. 530
infectious, iii. 584
  actual cautery in, iii. 586
  alterative ointments in, iii. 586
  antitoxin in, iii. 585
  argyrol in, iii. 586
  atropine in, iii. 586
  bichloride in, iii. 586
  copper sulphate in, iii. 586
  drainage in, iii. 586
  excision in, iii. 586
  expression in, iii. 586
  hot compresses in, iii. 586
  incision in, iii. 586
  silver nitrate in, iii. 586
membranous, hydrogen dioxide in, v. 573
Parinaud's, see Conjunctivitis, Infectious, iii. 584; also this Index.
phlyctenular, iii. 575
  arsenic in, iii. 577
  atropine in, iii. 575, 577
  boric acid in, ii. 585; iii. 575, 577
  brisk rubbing in, iii. 577
  calcium phosphate in, iii. 577
  calomel in, iii. 575, 576, 577; vi. 673, 679
  codliver oil in, iii. 577
  cold baths in, iii. 577
  diet in, iii. 575, 577
  exercise in, iii. 575, 577
  fresh air in, iii. 575, 577
  immersions of head in cold water in iii. 577
  iron iodide in, iii. 577
  jequiritol in, vi. 94
  mercury bichloride in, iii. 577
  mercury (yellow oxide) in, iii. 575, 577
  salt baths in, iii. 577
  silver nitrate in, iii. 577
  soda solution in, iii. 577
  tinted glasses in, iii. 577
  tonics in, iii. 575
  tuberculin in, iii. 575, 576
  warm compresses in, iii. 575
  white precipitate ointment in, iii. 577
purulent, iii. 559
subacute, zinc acetate in, viii. 837
  zinc sulphate in, viii. 837
swimmer's.

Huntemüller and Paderstein (Deut. med. Woch., Jan. 9-16, 1913) found chlamydozoa—an alleged cause of trachoma—in the discharges of patients with so-called "swimming tank conjunctivitis." In most cases the clinical picture was one of acute trachoma, and there was a history of the use of the public tanks very shortly before the lesions appeared.

H. S. Gradle (Ophthalmology, July, 1916), after trying everything he could think of, found that a 1 per cent. solution of silver nitrate daily, and a 10 per cent. solution of argyrol 3 times a day or more were beneficial. The silver nitrate seemed most effective when dropped directly into the conjunctival sac, for forcible closure of the lids spreads the caustic into the depths of the transitional folds, the parts most affected.

vernal, iii. 557
  acetic acid in, iii. 558
  arsenic in, iii. 559
  black bandage in, iii. 559
  boric acid in, iii. 558
  dark glasses in, iii. 558
  electrolysis in, iii. 559
  holocaine in, v. 537
  ice-compresses in, iii. 559
  iron in, iii. 559
  massage of lids with yellow oxide of mercury in, iii. 559
  obliteration of superficial vessels in, iii. 559
  quinine in, iii. 559
Connell's technique in end-to-end intestinal anastomosis, i. 70
Constipation, iii. 596; see also Intestinal Stasis, including Hirschsprung's Disease, this Index, for surgical treatment.

A. Martinet (Presse méd., June 15, 1916) calls attention to the remarkable prevalence of constipation recently observed among soldiers in active service, due in part to insufficiency of green vegetables and fruit in the diet, a relatively sedentary life in the trenches, and intestinal inhibition of psychic origin. In the matter of diet the simplest prophylactic measures would consist in the addition of prunes, raisins, and "pounded" apples and pears, together with the avoidance of white bread. During active campaigning the following pills are recommended for occasional use:—

℞ *Extracti hyoscyami* .... 0.02 Gm. (⅓ gr.).
Extracti rhei,
Extracti rhamni purshianæ,
Extracti euonymi ......āā 0.05 Gm. (⅚ gr.).
Saponis .... q. s.

Fiat pilula No. 1. Sig.: Two to three pills a day at meal time.

abdominal massage in, iii. 607, 608
agar-agar in, i. 481; iii. 606, 611

Medicated agars considered useful by Einhorn (N. Y. Med. Jour., May 30, 1914). Phenolphthalein-agar, containing 0.03 Gm. (½ grain) of phenolphthalein in 1 Gm. (15 grains) of agar, and rhubarb-agar, containing 1 c.c. (16 minims) of fluidextractum rhei in 1 Gm. (15 grains) of agar, prepared by dissolving the remedy in boiling agar water solution, thoroughly mixing, evaporating to the original dry agar volume, and grinding up into flakes. Of this he gave 1 teaspoonful twice daily in water after meals.

aloes in, i. 569
aloin in, iii. 606, 609
appendicostomy in, iii. 612
beechwood creosote in, iii. 606
beef juice in, iii. 607
belladonna in, ii. 449; iii. 606, 609
Bier's hyperemia in, v. 596
bile in, i. 798; iii. 606, 607
boric acid in, ii. 585
bran in, iii. 611
butter in, iii. 607
cacao-butter suppositories in, iii. 609
calomel in, iii. 609
cascara sagrada in, iii. 606, 608, 609, 611
castor oil in, iii. 16, 609
coarse or brown bread in, iii. 605
codliver oil in, iii. 607
cold bath in, viii. 809
colocynth in, iii. 537, 606, 607
colonic flushings in, iii. 598
colopexy in, iii. 612

Constipation (*continued*).
- **cream** in, iii. 607
- **diet** in, iii. 598, 605, 606, 607

Kohnstamm (Therap. der Gegenwart, Aug., 1915) treats constipation by having all meat, fish and poultry dropped from the **diet** and their place taken by milk and dishes made with milk, cocoa, milk soups, etc. Meat soups and broths can be taken; they aid in the digestion of the vegetables and milk dishes. On this diet constipation refractory for years or decades can be conquered once for all in from 1 to 4 days.

- **divulsion of anus** in, iii. 611
- **electricity** in, iii. 609
- **enemata** in, iii. 598, 606, 607, 608, 609
- **enemata of glycerin** in, iii. 598, 608
- **enemata of oil** in, iii. 598, 609
- **enemata of warm soapsuds** in, iii. 598
- **enemata of warm water** in, iii. 606, 607
- **erasion of sigmoid and suspension of transverse colon** in, iii. 613
- **euonymus** in, iv. 707
- **excision of transverse colon** in, iii. 613
- **exercise** in, iii. 605, 611
- **fresh air** in, iii. 607
- **fruit** in, iii. 605
- **gelatin** in, v. 16
- **glycerin** in, iii. 598, 608, 611
- **glycerin suppositories** in, iii. 606, 609
- **hormonal** in, iii. 610

[Many surgeons have used **hormonal** in post-operative intestinal paresis without encountering serious untoward effects. On the whole, however, these have occurred in so many instances, often assuming dangerous proportions, that in recent years very little *bona fide* literature on the subject seems to be available. C. E. DE M. S.]

- **hormone injections** in, i. 799; iii. 610
- **hydrotherapy** in, iii. 609
- **hyoscyamus** in, iii. 606, 607
- **hypnotic suggestion** in, iii. 609
- **ichthyol** in, v. 637
- **ipecac** in, iii. 606; vi. 58
- **lateral anastomosis from one limb of sigmoid to the other**, iii. 613
- **laxative mineral water** in, iii. 605
- **leptandra** in, vi. 330
- **licorice powder** in, iii. 609

Constipation (*continued*).
- **light diet** in, iii. 598
- **linseed oil** in, vi. 365
- **magnesia (calcined)** in, iii. 609
- **malt extracts** in, iii. 607
- **massage** in, iii. 606, 607, 608, 609

P. Merklen (Bull. méd., Apr. 1, 1914) found physical measures the most useful of all in constipation, especially **warming compresses** over the whole abdomen at bedtime. A cold compress is first applied, then a piece of some impervious material, next a layer of cotton wool, and finally a flannel bandage. This compress is to be kept on the whole night unless the patient wakes some hours after going to sleep, in which event it may be removed at that time. When the compress is removed it is found in a steaming condition; it is the transition from coolness of the abdomen to the heated condition which awakens the motility of the intestinal involuntary muscle. **Massage** of the abdomen, by the patient himself or by another person, the strokes being executed circularly for about 5 minutes morning and evening, is also a valuable measure. The masseur's hand should be covered with petrolatum or talcum powder.

- **mercury bichloride** in, vi. 680
- **mineral salts** in, iii. 609
- **mineral waters** in, iii. 609
- **nux vomica** in, iii. 606, 607, 609
- **oil-paper suppository** in, iii. 607
- **olive oil** in, vii. 170
- **olive-oil injections** in, iii. 605
- **open-air exercise** in, iii. 605
- **operative procedures** in, iii. 611, 613
- **ox-bile** in, iii. 606, 607
- **paraffin** in, iii. 608

Hill (Arch. of Pediat., Feb., 1915) states that in the chronic constipation of infants, **liquid paraffin** in large doses gave him the best results he had obtained. With it and **lactic acid** bacilli very remarkable results may be obtained in diseases caused by putrefactive or allied poisons absorbed from the intestines.

- **pepsin essence** in, iii. 607, 611
- **peristaltic hormone** in, iii. 610

A vegetable oil cannot serve as a lubricant for the feces, according to Le Tanneur (Paris méd., June 24, 1916), until the amount ingested surpasses the dose normally saponified by the liver and pancreas. Hence, to take olive oil for the purpose, as some recommend, imposes a useless burden on these 2 organs. **Liquid petrolatum,** on the other hand, seems to traverse the alimentary canal without exciting any reflex action in the liver. Three years of experience with refined liquid petrolatum have confirmed its valuable lubricating action and its healing influence on the minute excoriations from hard feces.

phenolphthalein-agar in, iii. 606

McWalter (Lancet, Nov. 20, 1915) has prescribed rather more than 1000 doses of **phenolphthalein.** The dose for children is ½ to ¾ of a grain (0.03 to 0.048 Gm.), and for adults 2 to 6 grains (0.13 to 0.4 Gm.). He has given it usually in doses of about 1½ grains (0.1 Gm.) repeated from 2 to 3 times a day; it produces loose motions in from 4 to 6 hours after a dose of 3 to 4 grains (0.2 to 0.26 Gm.), but where smaller doses are given it brings on a natural or somewhat soft and copious evacuation only once or twice daily. It is singularly painless as a rule. It does not seem to lose its effect for a considerable time.

physostigma in, vii. 459

J. Herold (Lancet-Clinic, May 13, 1916) regards **physostigmine** as useful in chronic constipation, particularly for women who during menopause suffer from headache, vertigo, and flatulence.

podophyllum resin in, iii. 606
Priessnitz half-bath in, viii. 809
prunes in, iii. 611
rhubarb in, iii. 609; viii. 30
rhubarb-agar in, iii. 606
saline aperient in, iii. 609
saline solution in, iii. 607; viii. 187
senna in, viii. 116
silver nitrate in, viii. 135
soap and glycerin suppositories in, iii. 609
Constipation (*continued*).
  sodium bicarbonate in, iii. 605
  sodium chloride in, iii. 605; viii. 187
  sodium citrate in, iii. 605
  sodium phosphate in, iii. 605
  sodium sulphate in, iii. 605; viii. 186
  stillingia in, viii. 324
  strychnine in, vii. 149
  surgical intervention in, iii. 611, 613

J. R. Eastman (N. Y. Med. Jour., June 24, 1916) holds that many cases of habitual constipation are due to congenital and inflammatory bands, which draw the sigmoid into a sharp angulation near the left internal abdominal ring. He advises the systematic inspection of the site of this deformity, and the division of congenital folds and inflammatory strictures. In addition to habitual constipation, will often be found associated such states as melancholia, neurasthenia, and hysteria, which are promptly relieved by the operation.

  suspension of sigmoid flexure in, iii. 613
  suspension of transverse colon in, iii. 613
  taraxacum in, viii. 503
  vegetables in, iii. 605
  ventro-omental fixation in, iii. 613
  vibratory massage in, iii. 609
  water in, iii. 611
  zinc phenolsulphonate in, viii. 836
atonic, **magnesium citrate** in, vi. 473
  magnesium sulphate in, vi. 473
chronic, **cold douches** in, viii. 811
  rhamnus purshiana in, vii. 822
due to adhesions following laparotomy, **thiosinamine** in, viii. 530
due to deficiency of glandular secretions of intestines and liver, **podophyllum** in, vii. 566
in dyspeptics, **sodium citrate** in, viii. 188
of hepatic congestion, **sodium bicarbonate** in, viii. 188
  sodium citrate in, viii. 188
  sodium sulphate in, viii. 188
of neurasthenia, **olive oil** in, vii. 171
of nurslings, **jalap** in, vi. 90
  light therapy in, vi. 362
of pregnancy, **rhubarb** in, viii. 30
of young children, **podophyllum** in, vii. 567

Constipation (*continued*).
  uremic, **magnesium sulphate** in, vi. 474
Consumption, see Tuberculosis, Acute and Chronic Pulmonary, viii. 592, 597; also this Index.
  galloping, viii. 596
  negro, see Hook-worm, vii. 310
Continued fevers, **ammonium carbonate** in, i. 617

Rossi (Riforma médica, Sept. 18, 1916) observed in young women, a young man, and several children, a type of continued fever which persisted a year or two or more. There was depression and a slight rise in temperature for which absolutely no cause could be discovered. The writer attributes this disorder to disturbance in the innervation of the glands with an internal secretion.

[From my viewpoint, the ductless glands are dominating factors in the genesis of all febrile manifestations. But inasmuch as fever occurs as a defensive function calculated to offset an intoxication of some sort, the theory that a functional disturbance of the nervous system accounts for the febrile process fails to explain the phenomenon. C. E. DE M. S]

Continuous baths, viii. 812
Contracted kidney, primary or genuine, see Nephritis, Chronic Non-exudative, ii. 620; also this Index.
  pelvis, an indication for induction of abortion, i. 181
Contraction of fascia, viii. 510
Contracture, vi. 767
  ischemic muscular, vi. 767
Contusions, **alcohol** in, i. 532, 534
    ammonium acetate in, i. 615
    iodine tincture in, vi. 36
    magnesium sulphate in, vi. 476, 477
    tropacocaine in, viii. 590
  of the abdomen, i. 102
  of arteries, viii. 800
  of nails, vi. 782
  of nerves, viii. 254
  of the penis, vii. 339
Convalescence, **alcohol** in, i. 531
    calumba in, ii. 722
    eucalyptus in, iv. 705
    gentian in, v. 19
    guarana in, v. 149
Convalescence (*continued*).
    pancreatin in, vii. 298
    strychnine in, vii. 136, 147
  from acute diseases, **pepsin** in, vii. 362
  weakened heart of, **cactus grandiflorus** in, ii. 708
Convallamarin, see Convallaria Majalis.
Convallaria majalis, iii. 614
Convallarin, see Convallaria Majalis.
Convergent strabismus, viii. 400
Convolvulin, vi. 90
Convulsions, **aconite** in, i. 282

In the differential diagnosis of convulsions Flatau (Med. Klinik, Jan. 7, 1917) states that when the patient suddenly sees things around as if removed to a distance or becomes very small, the trouble is more liable to be *hysteria* than epilepsy. An actual epileptic seizure must have occurred before it is possible to label the case as epilepsy. Night convulsions, waking out of sleep, are apt to be epileptic. Fainting may be the first manifestation of petit mal. Loss of consciousness seldom lasts longer than 30 minutes in epilepsy, while in hysteria prolonged unconsciousness is the rule. Flinging the arms around and curving the whole body (*arc de cercle*) speak for hysteria, but an epileptic may also have hysteric convulsions. The family history is also instructive; migraine is often present in 1 of the parents.

    calcium chloride in, ii. 719
    chloroform in, iii. 264
    dormiol in, iv. 336
  hysterical, **scopolamine** in, viii. 103
  in status lymphaticus, iii. 622
  infantile, iii. 616

Newell Jones (West. Med. Rec., May, 1916) empties the alimentary tract by **gastric** and **colonic lavage** and a full dose of **castor oil** or salts, preferably by the stomach tube. To suppress the convulsions and reduce the likelihood of recurrence nothing gives better results than full doses of **chloral hydrate**. Doses of 7 to 15 grains (0.45 to 1 Gm.) may be given to a child of 2 years and may be administered either orally, by the rectum or subcutaneously. After the child is quieted, a hot pack may be given.

acetanilide in, iii. 624
amyl nitrite in, iii. 624
antipyrin in, iii. 624
artificial respiration in, iii. 624
asafetida in, ii. 190

Rascher (Münch. med. Woch., Jan. 4, 1916) recommends atropine in eclampsia infantum. He used it with marked effect in a 3-year-old girl. The child had had a series of convulsions without apparent cause. Her temperature was high. The paroxysms were becoming serial. Laryngospasm coexisted. The author mixed the contents of an ampoule (0.001 Gm.—1/64 grain—of atropine) with 9 c.c. (2¼ drams) boiled water and injected a syringeful (making, he says, about 1/650 of a grain—0.0001 Gm.). The symptoms improved almost immediately and no more crises occurred.

blood-letting in, iii. 624, 625
bromides in, iii. 624, 626
calcium in, iii. 627
calomel in, iii. 624, 627
castor oil in, iii. 624, 627
chloral in, iii. 209, 624, 626
chloroform in, iii. 624
coal-tar products in, iii. 624
coffee in, iii. 627
cold bath in, iii. 625
cold to head in, iii. 625, 627
cool pack in, iii. 626
emetic in, iii. 626
enema in, iii. 625, 627
ether (sulphuric) in, iii. 624
heat in, iii. 627
hot bath in, iii. 624
hot wet pack in, viii. 813
hydrotherapy in, iii. 624, 625
hypodermoclysis in, iii. 625, 627
ice-pack in, iii. 625
leeches in, iii. 625
lobelia in, vi. 436
lumbar puncture in, iii. 620, 624, 625
magnesia (milk of) in, iii. 627
massage of heart in, iii. 624
morphine in, iii. 625, 626
mustard bath in, iii. 624
mustard pack in, iii. 625
oxygen in, iii. 624, 626

Convulsions, infantile (*continued*).
phosphates in, iii. 626
phosphorus in, iii. 627
physostigma in, vii. 459
rhubarb syrup in, iii. 624
rue in, viii. 44
saline solution in, iii. 617, 624, 627
salt enema in, iii. 625
sodium bromide in, iii. 626
stimulants in, iii. 624, 627
stimulating enemata in, iii. 627
strychnine in, iii. 627
tongue depression in, iii. 627
veratrum viride in, iii. 626
warm pack in, iii. 626
washing out stomach in, iii. 624
puerperal, see Puerperal Eclampsia, vii. 706; also this Index.
salaam, see Automatic Rhythmical Movements, iii. 638; also this Index.
uremic, chloral in, iii. 209, see also Uremia, viii. 671, and this Index.
veratrum, tincture of, in, viii. 806
Convulsive diseases of infancy and childhood, iii. 615
Coolie itch, see Dermatitis, iii. 791
Copaiba, iii. 640
Copper, iii. 641
acute poisoning, iii. 642
counterirritation over abdomen in, iii. 644
demulcents in, iii. 644
opium in, iii. 644
potassium ferrocyanide in, iii. 644
potassium iodide in, iii. 644
washing stomach with alkaline solutions in, iii. 644
chronic poisoning, iii. 643

E. Harnack (Deut. med. Woch., July 23, 1914) observed a case of chronic copper poisoning from a dental bridge in a young woman. The alloy in the bridge was only eight carat fine.

magnesium sulphate in, iii. 644
milk in, iii. 644
phosphoric acid in, iii. 644
sodium in, iii. 644
disinfection.

Sulphate.—S. J. Thomas (Jour. Amer. Med. Assoc., Sept. 25, 1915) says that on analysis the pool water in the Taylor Gymnasium at Lehigh University was shown to contain, just after filtration and before any one entered the pool, 10 bacteria per cubic centimeter, and no colon bacilli; after 40 men had been in the pool, although all the preliminary sanitary precautions had been taken, the water contained 5300 bacteria per cubic centimeter, 200 of which were colon bacilli. Copper sulphate can be used in germicidal quantities without any disagreeable results. The writer found that about 1/20 (0.04) part of the copper sulphate to a million parts of water, used every day, kept the water pure.

DeWitt and Sherman (Jour. of Infect. Dis., Apr., 1916) found experimentally that very low concentrations of copper will, if sufficient time is allowed, kill or inhibit the growth of many pathogenic organisms. A dilution of 1:100,000 prevented the growth of tubercle bacilli in the test tube. Some organisms (notably *B. prodigiosus*) were found markedly susceptible, while others (*staphylococcus aureus* and the molds) were very resistant, surviving 15 minutes' exposure to a 5 per cent. solution, a high concentration.

lecithin.

E. A. Oppenheim (Berl. klin. Woch., June 15, 1914) obtained favorable results from the external use of copper **lecithin** preparations in certain cases of surgical tuberculosis, particularly when they were given intravenously or by inunction. Intramuscular injections were also given. For local use he employed a 3 per cent. salve of cinnamic acid copper lecithin, a 4 per cent. copper chloride lecithin salve, and a 5 per cent. solution of copper dimethyl acetate. For injection intravenously the last preparation was also employed. A paste was also made for filling into sinuses and cavities which contained 1/4 per cent. of copper. The latter seems to act solely as a germicidal with special affinity for the tubercle bacillus, inhibiting its growth in dilutions of 1 to 1,500,000.

test for pancreas functioning, vii. 289

Coprostasis, intestinal obstruction due to v. 765

Cor bovinum, v. 257

Coracoid process, fracture of, iv. 765. See also Fractures, this Index.

Corectopia, vi. 62

Corn, see Clavus, viii. 167; also this Index.

Cornea, burns of the, iii. 668

bandage in, iii. 668

boric acid in, iii. 668

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picric acid in, vii. 461

potassium bicarbonate in, iii. 668

soapsuds in, iii. 668

sodium bicarbonate in, iii. 668

vinegar and water in, iii. 668

disinfection of, **iodine ointment** in, vi. 38

disorders of the, iii. 647

foreign bodies in, iii. 668

cocaine in, iii. 668

removal of, iii. 669

infections, **acetozone** in, i. 243

inflammation of, see Keratitis, iii. 647; also this Index.

injuries of, iii. 668

Covering with conjunctiva is the most effective way of treating wounds of the cornea, according to Kalt (Surg., Gynec. and Obstet., from Ann. d'ocul., cliii, 23, 1916), provided of course they are not infected and there is no foreign body remaining in the eye. It should be done as soon as possible after war wounds, and the fact that there is a possibility of infection should not act as a deterrent. The conjunctiva is easily brought from the upper and lower culs-de-sac, but if there is much resistance from the sides the suture should be horizontal.

After the eye is anesthetized with cocaine a circular incision is made; it is then brought forward with small forceps, one at each extremity of the horizontal diameter, so that the circular opening is transformed into a horizontal cleft. The two surfaces are then applied to each other and sutured with very fine sutures. This will keep the cornea covered for a month, when the conjunctiva should be clipped with scissors leaving the cornea uncovered again. This allows time for the healing of the wound. The sutures are removed about the tenth day.

Cornea (*continued*).
  leucoma of, thiosinamine in, viii. 530
  opacities of, iii. 670
    ammonium chloride in, iii. 674
    calomel in, iii. 674
    copper citrate in, iii. 645
    dionin in, iii. 673; vii. 182
    electrolysis in, iii. 674
    iodine vasogen in, iii. 673
    iridectomy in, vi. 64
    jequiritol in, vi. 94
    magnesium sulphate in, vi. 477
    massage of cornea in, iii. 674
    mercurial inunction in, iii. 674
    mercury cyanide injections in, vi. 683
    mercury (yellow oxide) in, iii. 673; vi. 672
    pilocarpine in, vii. 471
    pressure inunction in, iii. 674
    tartaric acid in, iii. 674
    tattooing in, iii. 674
    thiosinamine in, viii. 530
    following parenchymatous keratitis, dionin in, vii. 191
  scars after parenchymatous keratitis, dionin in, vii. 182
  scrofulous ulcers of, dionin in, vii. 182
  torpid infiltrations of, dionin in, vii. 182
  tumors of, iii. 674
    nitric acid in, iii. 675
    removal of, iii. 675
  ulceration, airol in, i. 486

L. M. Scott (Jour. Amer. Med. Assoc., Apr. 22, 1916) lays stress on the fact that an infected tear passage may be found in the greater number of serpiginous ulcers of the cornea. The specific micro-organism in such ulcers is the pneumococcus, and an injury to the cornea furnishes the point of entrance usually. The laboring classes are the principal sufferers.

    alsol in, i. 589
    aristol in, ii. 118
    atropine in, ii. 445
    bacterial vaccines in, ii. 419
    Bier's hyperemia in, v. 596, 597
    dionin in, vii. 191
    formaldehyde in, iv. 737
    holocaine in, v. 537
    hydrogen dioxide in, v. 568, 573
    iodine tincture in, vi. 38
    iodoform in, vi. 54
    mercury (yellow oxide) in, vi. 672

Cornea, ulceration (*continued*).
    physostigmine in, vii. 460
    potassium chlorate in, vii. 583

Scarlet red was found by Allan (Therap. Gaz., Jan., 1913) to promote rapid healing in corneal or conjunctival abrasions, wounds, or burns. A minute portion of the ointment is placed on conjunctival surface of everted lower lid and a pad and bandage applied, once daily or on alternate days. Atropine also to be used, if indicated.

    stovaine anesthesia in, viii. 398
Corns, see Clavus, viii. 167; also this Index.
Cornu cutaneum, formaldehyde in, iv. 737
Cornutol, iv. 566
Coronoid process, fracture of, iv. 772
Corpus luteum organotherapy, i. 788

.Physiology, i. 788.—E. Novak (Med. Rec., June 17, 1916) studied the relationship between character and degree of lutein structure to the disorders of menstruation, such as metrorrhagia and menorrhagia in 137 cases. The corpus luteum, he says, should be studied from the standpoint of origin in the lutein cells. Cases of amenorrhea show characteristically corpora lutea. It is absent in young girls and in the fetus, also in the menopause. With amenorrhea of lactation it is present, the functioning breast probably presenting an inhibiting secretion. In metrorrhagia and menorrhagia there were negative findings and no histological changes could be found connected with menstrual disturbances. The theca interna instead of advancing from lutein cells simply regresses. The granulosa cells are formed before the lutein cells, and the latter are formed from them. The internal secretion goes back into the blood. Hence the vascularization.

A remarkable instance of the correlation of the corpus luteum with the secondary sex characters has been described by Pearl and Surface of the Maine Agricultural Experiment Station at Orono (Editorial Jour. Amer. Med. Assoc., July 24, 1915). A cow which had produced 3 calves and given an abundant flow of milk suddenly ceased to secrete it. The udder rapidly shrank to a small size and the animal began to show the external characteristics of a bull. After a lapse of 8 months the assumption of male characters was complete and perfect. A necropsy showed as the only gross abnormality a simple cystic condition of the ovaries. Histologically and cytologically these organs differed from the normal cow's ovary in only 1 essential respect, namely, that they had no corpora lutea. The interstitial secreting mechanism of the cow's ovaries was entirely normal.

Therapeutics, i. 789.—W. T. Dannreuther (Jour. Amer. Med. Assoc., Jan. 31, 1914) uses an extract derived from the ovaries of pregnant animals. He gives 5-grain doses (0.3 Gm.) 3 times every day. The blood-pressure of the patient should not be allowed to fall more than 15 mm. below the patient's normal pressure, and never below 90 mm. The particular conditions for which the drug is found serviceable are: Functional amenorrhea or scanty menstruation; dysmenorrhea of ovarian origin; manifestations of physiologic or artificial menopause, such as nervous or congestive disturbances of reflex origin (hot flushes, psychoneuroses, etc.), "neurasthenic" symptoms during menstrual life; sterility, not due to pyogenic infections or mechanical obstructions; where the function of 1 ovary is impaired, or 1 ovary has been removed, and the compensatory activity of the other is insufficient; repeated abortions, not due to disease or mechanical factors, and hyperemesis in early pregnancy.

Autotransplantation of the corpus luteum was resorted to by DeLee (Surg., Gynec. and Obstet., Jan., 1916) in 2 cases. Both women complained of nausea and vomiting for several days after operation. In neither case was the implanted body palpable in the broad ligament at a later operation.

Corrosive sublimate, see Mercury, vi. 650, also this Index.
  poisoning, vi. 667, also Mercury, this Index.
  magnesium sulphate in, vi. 474
Corset liver, vi. 368
Coryfin, vi. 649
Coryza, see Acute Rhinitis i. 347; also this Index.
  chronic, see Rhinitis, Simple Chronic, vii. 70, also this Index.
  idiosyncratic, see Hyperesthetic Rhinitis, v. 600; also this Index.
  periodic paroxysmal vasomotor, see Hyperesthetic Rhinitis, v. 600; also this Index.
  spasmodic, see Hyperesthetic Rhinitis, v. 600; also this Index.
Costal cartilages, dislocation of, iv. 308
  fracture of, see Dislocations, iv. 296
Cotarnine, iii. 675
Cottonseed oil, iii. 676
Cough, **aspirin** in, ii. 220
  lactucarium in, vi. 243
  mustard in, vi. 774
  pantopon in, vii. 177
  bronchitic, **lobelia** in, vi. 437
    thiocol in, viii. 528
    hyoscyamus in, v. 579

[A "bronchitic" cough, so-called, should always suggest the possibility of latent tuberculosis. Without telling the patient, the **iodides**, and **creosote carbonate** should form the basis of treatment, with other indications for tuberculous infection, the typical signs of which are manifestations of active lesions which should be obviated. To await the bacillus as evidence and even the tuberculin reactions is to compromise the patient's life. C. E. de M. S.]

  hysterical, **gelsemium** in, v. 18
  irritative, **anhalonium Lewinii** in, i. 700

For the relief of tickling cough, especially that which follows influenza, tuberculous laryngitis, etc., A. Kinsey-Morgan (Lancet, Dec. 23, 1916) commends the following:

℞ *Codeinæ* ...... 0.1 Gm. (1½ gr.).
Acidi citrici ... 0.3 c.c. (5 min.).
Syrupi tolutani,
Syrupi pruni virginianæ,
Aquæ ....āā 16.00 c.c. (4 dr.).
M. et S. One teaspoonful repeated.

[Codeine should be employed with circumspection owing to the habit.

The cause and source of a cough should, of course, be carefully sought and treated if brought to light. But where doubt exists the **iodides** are always safe, and where persistent endolaryngeal irritation or tickling exists, the **bromides** efficiently replace opiates. **Menthol** inhalations, and **terpine hydrate** internally are often efficient. C. E. de M. S.]

paraldehyde in, vii. 302
terebene in, viii. 635
spasmodic, aconite in, i. 282
belladonna in, ii. 448
gelsemium in, v. 18
grindelia in, v. 142
musk in, vi. 773
thermal waters in, vi. 709
zinc valerate in, viii. 836
winter, ipecac in, vi. 59
tar oil inhalations in, viii. 501

J. B. Todd (N. Y. Med. Jour., Jan. 15, 1916) makes the statement that a few doses of **sodium salicylate** and repeated small doses of **mineral oil** soothe the throat and relieve the cough. The following is taken readily by children as well as adults:—

℞ *Pure mineral oil* .. ʒvj (24.0 Gm.).
Oil anise .... ♏v (0.3 c.c.).
Syrup of citric acid ℥ij (60.0 c.c.).
Syrup of tolu,
q. s. ad ......āā ℥iv (120.0 c.c.).
M. Shake. Sig: One-half teaspoonful every hour.

Most of these cases are found in homes when a prejudice exists against fresh air. A **cloth screen** in the window of the sleeping room causes the trouble soon to fade away.

Coughlin and Young's technique in hernia, v. 469
Counterirritation, iii. 676
Counting-chambers for blood-cells, v. 375
Courvoisier's sign, vi. 432
Cowperitis, viii. 695
gonococcus vaccine in, ii. 350
Cow-pox, see Varioloid and Vaccination, viii. 785
Coxa vara, vi. 151, 155, 159; vii. 234
osteotomy in, vii. 234
Coxalgia, hysterical, vi. 153
sciatic, **guaiacol** in, v. 147
Coxe's hive syrup, see Antimony, ii. 19; and Squill, viii. 317
Coxitis, vi. 151; see also Hip-joint Disease, this Index.
Cramps, abdominal, in older children, **turpentine** in, viii. 634
in the extremities, **hot compresses** in, viii. 814
scopolamine in, viii. 103
foot-bath in. viii. 813
muscular, **atropine** in, ii. 450
telegrapher's, **Bier's hyperemia** in, v. 595
writers', **Bier's hyperemia** in, v. 594, 595
Craniectomy, v. 175
Cranioplasty.

Mauclaire in reporting a case in which Leclerc and Walch (Bull. et mém. Soc. de chir. de Par., xlii, 2021, 1916) used an **osseous graft** taken from the scapula, describes the methods of repairing cranial losses: periostic, osteoperiostic, and cutaneoperiostic cranioplasty; autoplastic, homoplastic, or heteroplastic osseous grafts; **cartilaginous grafts**; transplants of macerated, decalcified, carbonized, calcined or sterilized bone; cranial prosthetics; finally, fat, serous, and fibrous complementary grafts. All these methods have given good results, the cartilaginous being that most generally employed. Generally speaking, however, osseous and cartilaginous grafts are preferable to prosthetic procedures with ivory, metallic, or other plates. Where cerebral functions have been impaired, repair of the osseous defect does not cause functional amelioration.

Craniotabes, v. 174
antisyphilitic treatment in, v. 174
avoidance of injuries in, v. 174
codliver oil in, v. 174
hypophosphites of lime and soda in, v. 174
Craniotomy, v. 175
insufflation anesthesia in, iv. 685
Craw-craw, iii. 677
belladonna in, iii. 677
betanaphthol ointment in, ii. 677
ichthyol in, iii. 677
salicylic spirit lotion in, iii. 677

Cream of tartar, see Potassium Bitartrate, vii. 573
Cream poisoning, viii. 573
Creasote, see Creosote, iii. 677
Creatinin, test for, in blood, see Kidney Tests, this Index.
Creolin, iii. 690
Creosal, iii. 679
Creosotal, iii. 678
Creosote, iii. 677
carbonate, iii. 677
poisoning, iii. 681
atropine in, iii. 683
coffee by rectum in, iii. 683
demulcent drinks in, iii. 683
digitalis in, iii. 683
heat in, iii. 683
magnesium sulphate in, iii. 683
morphine in, iii. 683
strychnine in, iii. 683
washing out of stomach in, iii. 681, 683
Cresol, iii. 690
iodide, see Europhen, iv. 708
Cretinism, i. 717; vii. 668

Etiology, vii. 669.—Major R. McCarrison (Lancet, Mar. 21, 1914) concludes, after a series of experiments in white rats: 1. Of the offspring of goitrous parents a small percentage are born cretins, approximately 63 per cent. are born with congenital goiter, 32 per cent. are born with congenital parathyroid disease, and 33 per cent. are born with normal thyroid and parathyroid glands. 2. Cretinism and congenital goiter are due to the action of toxic substances derived from the intestines of the goitrous mother on the fetal thyro-parathyroid mechanism. Cretinism represents the maximum, and comparatively rare, effect of these toxins; congenital goiter, their minimum, and comparatively common, effect. Between these extremes all degrees of thyroid involvement may occur with or without associated swelling of the gland. 3. Congenital parathyroid disease is due to toxic products of organisms in the goitrous mother, capable of growth under anerobic conditions.

R. S. Haynes (Trans. Amer. Pediat, Soc.; Pediatrics, Sept., 1915) reported a case in which the symptoms of hypothyroidism cleared up under the administration of **pituitary** capsules. There was a striking change in the contour of the hands, ankles, hips, buttocks, thighs and shoulders. The effect produced on the child's disposition was also striking.

C. Hermann referred to the foregoing case as bearing out the contention that very frequently more than 1 gland is affected. He used a tablet containing the 3 glands, **thyroid, suprarenal and pituitary**; and in some cases obtained better results than when thyroid alone was used.

H. R. Basinger (Arch. of Internal Med., Feb., 1916) reports therapeutic experiments carried out in young rabbits in which cretinism had been induced by complete thyroidectomy at the age of 2 to 3 weeks, when the animals weighed about 175 grams. Transfusion of blood from animals rendered "hyperthyroid" by thyroid feeding, increased the growth of the cretins and controlled other symptoms, though not as markedly as direct thyroid feeding.

Pathology.—The energy metabolism of a cretin 3 years and 8 months old studied by F. B. Talbot (N. Y. Med. Jour., Sept. 2, 1916) in the Benedict respiratory chamber. He found that when the child was quiet, he produced 39 to 42 calories to the kgm. of body weight. This was relatively lower than in normal babies. The metabolism, estimated on the basis of body surface, was also relatively lower than that of 2 normal babies of 8½ and 10 months.

Treatment, i. 717.—C. Herrmann (N. Y. State Jour. of Med., Aug., 1914) summarizes his results in 41 cases of sporadic cretinism thus: (1) Under **thyroid** treatment, if begun early, the physical development may reach normal. (2) When treatment is begun late the physical as well as the mental development may remain much below normal. (3) The improvement in the mental development is never as great as in the physical. (4) The earlier the treatment is begun the better the mental results.

(5) In congenital cases, if the treatment is begun after the first year, marked intellectual retardation persists. (6) The treatment must be regular and continuous. (7) In the acquired as against the congenital form, the intellectual development is less retarded than the physical development.

Fowler's solution in, i. 722

thyroid gland in, i. 710, 713, 717, 751

E. Hertoghe (Chicago Med. Rec., May, 1915) generally gives **thyroid gland** in the form of tablets, 1, 2, or 3, containing 5 grains (0.5 Gm.) each, according to the case. He forbids alcohol—wine, beer, or anything of the kind, and smoking. Cold baths are to be avoided owing to the low temperature of the patients. **Hot baths** are very useful and agreeable to them. Small quantities of sugar and sweets may be allowed.

thyroid grafts in, i. 726

Grafting was resorted to by Mamourian (Brit. Med. Jour., Nov. 14, 1914) in a 4-year-old cretin, who had received thyroid extract regularly for 3 years. Even 20 grains (1.3 Gm.) for 6 months failed to procure improvement. A sheep was killed while the child was being anesthetized, and the animal's thyroid was removed, scarified and implanted in the child's omentum, which also was scarified. The patient then increased 10 inches in height in 4 years and improved very markedly in appearance and in intelligence. He can read and write, tell the time of day, etc.

nervous.

A case of nervous cretinism was observed by F. G. Crookshank (Proceed. Royal Soc. of Med.; Med. Rec., Apr. 11, 1914). The child, a girl aged 5½ years, had spoken early, but walked late; the present complaint was dribbling, stumbling, asthenia, harsh skin, tottering gait, with knee-jerks increased. Small doses of thyroid were given. Subsequently, but little change if any for the better occurred, and the speech became defective. The gait was that of ataxic paraplegia. The dose was quickly increased and regularly maintained, and the child now walks and talks well.

Major E. McCarrison (Brit. Jour. Children's Dis., Dec., 1914) gives the name "nervous cretinism" to a combination of congenital myxedema with congenital cerebral diplegia in all their varying grades. The nervous symptoms are due to a thyroparathyroid defect, while certain cases of cerebral diplegia, associated with congenital diseases of the thyroparathyroid mechanism, may be cured or relieved by thyroid gland. The food and freedom from intestinal disorders are of great importance, the worst cases of the disease being seen in those children who are artificially fed. In nurslings cases are usually not detected until after lactation or until the lapse of the period when breast feeding should cease. Intestinal disorders from parasites bear a close relation to the function of the thyroid. Certain intestinal anaerobes have a bad effect on the thyroparathyroid mechanism; their growth should be inhibited by administration of **Bacillus lacticus bulgaricus**, by **intestinal antiseptics**, and cleansing irrigations of 1 per cent. **ichthyol** or other antiseptic.

Cricothyrotomy, vi. 289

Crile's method of intra-arterial infusion, v. 682

Crohn's apparatus, in cerebrospinal meningitis, vi. 626, 627

Crossed diplopia, see Strabismus, viii. 399

Crotalin.

Rattlesnake venom was recommended by Spangler in 1910 for epilepsy, but J. F. Anderson (Jour. Amer. Med. Assoc., Mar. 21, 1914) reports a fatality following the use of crotalin, pointing out that a sterile solution cannot well be assured.

Welch and Ewing already in 1896 showed that rattlesnake venom destroys the bactericidal properties of the blood. The laboratory findings in the case reported left no reasonable doubt that the death was due to the presence in the crotalin solution of pathogenic bacteria.

- Croton chloral, iii. 690
  - oil, iii. 691
    - poisoning, iii. 691
      - cardiac stimulants in, iii. 691
      - copper sulphate in, iii. 691
      - demulcent drinks in, iii. 691
      - external heat in, iii. 691
      - opium in, iii. 691
      - washing out of stomach in, iii. 691
- Croup, iii. 691
  - catarrhal, iii. 692

Diagnosis, iii. 693.—A. Levinson (Münch. med. Woch., Feb. 2, 1915) establishes the differential diagnosis by means of the stethoscope. This is placed over the upper part of the larynx, which is behind the thyroid cartilage, and slightly to the left of the median line, and then over the suprasternal fossa in the median line. Over the normal larynx of a child a supping sound is heard in inspiration and a similar, although somewhat longer, sound in expiration. In pseudocroup, an indistinct tone similar to that made in pronouncing the letter M is heard over the thyroid cartilage in inspiration, and a long drawn out supping sound is heard in expiration. Over the suprasternal fossa moist râles are heard in this condition both during inspiration and expiration, the sounds over the lungs being normal. In croup the sound heard on inspiration is deep and rough, and the inspiration is prolonged and is somewhat similar to the pronunciation of the letter V.

Suñer (Siglo Medico, Dec. 30, 1916) states that an inflammatory process in the lower air passages may cause the symptoms of true croup. In 1 such case a child of 7 had a mild tracheitis but nothing to suggest diphtheria at the time or later. In the night the child seemed to be suffocating with diphtheritic croup. Examination confirmed the absence of diphtheria but showed intense capillary bronchitis and the child soon died. Eight similar cases were later encountered.

Treatment, iii. 694
- alum in, i. 585
- aluminum carbonate in, i. 590

Croup, catarrhal (*continued*).
- ammonium chloride or carbonate, iii. 696
- antipyrin in, iii. 694, 695, 696

In all cases of croup occurring after measles, diphtheria antitoxin should be given, according to E. Suñer (Jahrb. f. Kinderheilk., vol. xxx, Nu. 6, 1914), even though the bacteriological examination is negative. Antitoxin should also be given in other cases in which diphtheria is suspected. Intubation is often indispensable.

- apomorphine in, ii. 67; iii. 695
- brown mixture in, iii. 695
- calomel in, iii. 695, 696
- camphorated oil in, iii. 694
- creosotal in, iii. 695
- creosote in, iii. 694
- croup kettle and tent in, iii. 694
- Dobell's solution in, iii. 696
- exercise in open air in, iii. 694
- hot poultice over throat and chest in, iii. 694
- iodine glycerole in, vi. 7
- ipecac in, iii. 694, 695
- liquid petrolatum spray in, iii. 696
- menthol in, iii. 696
- opium in, iii. 694
- oxygen inhalations in, vii. 274
- ozone in, vii. 278
- papain in, vii. 300
- petroleum in, vii. 413
- potassium bromide in, iii. 696
  - iodide in, vii. 584
- spice plaster in, iii. 396
- sponge saturated with hot water applied to throat in, iii. 694, 695
- thymol in, iii. 696
- tracheotomy in, iii. 694

- membranous, iii. 696
  - ammonium chloride in, iii. 697
  - antidiphtheritic serum in, iii. 697
  - calomel fumigations in, iii. 697
  - cold douches in, iii. 698
  - inhalation of steam in, iii. 697
  - intubation in, iii. 697, 698
  - ipecac in, vi. 58
  - lactic acid in, vi. 242
  - mustard foot-baths in, iii. 697
  - pepsin in, vii. 363
  - tracheotomy in, iii. 698; vi. 302
  - turpentine in, iii. 697
  - water treatment in, ii. 697
- pseudomembranous, lime water in, ii. 720

Croup (*continued*).
spasmodic, aconite in, i. 284
belladonna in, ii. 449
lobelia in, vi. 436
senega in, viii. 115
squill in, viii. 317
Croupous conjunctivitis, see Conjunctivitis, Croupous, iii. 577; also this Index.
enteritis, v. 714
pneumonia, see Pneumonia, Lobar, vii. 527; also this Index.
rhinitis, see Rhinitis, Croupous, vii. 68; also this Index.
stomatitis, vi. 725
Crusta lactea, see Pityriasis Simplex, vii. 477
Cryoscopy, iii. 698

L. Meunier (Presse méd., May 23, 1914) found that, after a test meal consisting of bread, the freezing point of the gastric contents is at first very low, but rises considerably during the succeeding hour and a half. After ingestion of meat, on the contrary, the freezing point is at first very high, then gradually falls. The author concludes that, whatever material is ingested, the freezing point tends gradually to a certain level, which is 0.35.

Cryotherapy, see Ether, Ethyl Chloride, Liquid Air, Refrigeration, etc.
Cryptophthalmos, vii. 209
Cryptorchidism, see Testicle, Undescended, vii. 347
Crystalline lens, anomalies of position of, iii. 701
congenital anomalies of, iii. 709
diseases of, iii. 701
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opacity of, see Cataract, iii. 42
parasites in, iii. 710
Cubeb, iii. 710
Cullen and Derge technique in nephrotomy, vi. 218
Culver's root, see Leptandra, vi. 330
Cumarin.

This new glucoside of apocynum cannabinum was tested by V. D. Zelensky (Roussky Vratch, Jan. 25, 1914) on animals. He concluded that it is an active cardiac tonic similar in action to drugs of the digitalis group.

M. R. Bonsman (Deut. med. Woch., Jan. 1, 1914) tried cumarin in 30 cases. Its use intravenously in doses of 0.0005 Gm. ($\frac{1}{120}$ grain) to 0.001 Gm. ($\frac{1}{64}$ grain) every second day until about 0.0065 Gm. ($\frac{1}{10}$ grain) had a good effect on the heart and diuresis, but it cannot replace digitalis, although occasionally efficacious where digitalis has failed. It is not followed by untoward symptoms, has no cumulative action, and does not disturb sleep.

A. Soldano (Semana Medica, June 10, 1915) found cumarin to be a rapidly acting cardiac stimulant, best given intravenously. It is a true diuretic with a selective action on the renal cells.

Cupping, iii. 711

Aubert (Lyon méd., cxxiv, 3, 1915) attests the value of blister cupping in pulmonary edema. The usual drawbacks of cantharidin blisters may be avoided, he found, by using an ordinary tumbler, with a lighted, crushed up piece of newspaper inside, applied to the skin in the dorsolumbar region. The tumbler is pressed firmly into the skin and left there for 1½ or 2 hours. Multiple blisters form under it, and they continue to secrete for about a week. He would use this for congestion of the lungs or viscera, and attacks of pain in the kidney, along the sciatic nerve, etc.

Curvature of the spine, see Scoliosis, viii. 276; also this Index.
Cusso, iii. 711
Cutal, i. 589
Cutaneous cyanopathy, see Chromidrosis, viii. 447
test in chronic pulmonary tuberculosis, viii. 608
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Cyanides of mercury, vi. 682

Cyanide of potassium, poisoning, **adrenalin** in, i. 768
Cyanosis, **nitroglycerin** in, vii. 56

J. H. Hess (Amer. Jour. Dis. of Children, Jan., 1917) observed 3 instances of familial cyanosis in boys, aged 11, 9, and 5 years respectively, all children of the same family. It affected the skin and mucous membranes and was constant, increasing with exertion, excitement, and inflammatory conditions of the respiratory tract, to which all 3 boys were subject. A careful study suggested that the blood sent from the left ventricle was a mixture of venous and arterial blood, and that the tension of oxygen in the arterial blood was below normal. When pulmonary ventilation was pushed, the color markedly improved.

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Cystadenoma, viii. 448
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Cystectomy, i. 98
Cysticercus cellulosæ, vii. 326
of the conjunctiva, iii. 588
excision in, iii. 588
of the orbit, vii. 211
of the peritoneum, vii. 396
Cysticum, viii. 544
Cystitis, iii. 712

Modern methods show, according to M. Vargas (Arch. de Med. Interna, Sept., 1916), that in many cases of supposed intestinal toxemia with fever, the urine shows evidence of a *cystitis or a pyelitis.* The usual organisms are the colon bacilli and less often the bacillus proteus and the staphylococcus. The treatment of such cases is the **alkalinization** of the urine with **potassium citrate**, and two irrigations of the bladder each day with **permanganate solution** one in two thousand.

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aconite in, iii. 723, 724
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Hagner (Surg., Gynec. and Obstet., Jan., 1915) tried with excellent results a method of treatment originally suggested by Caulk for alkaline cystitis and pyelitis, viz., instillations of a suspension of **lactic acid bacilli.** The bladder is irrigated with sterile

water, as any antiseptic solution might interfere with the growth of the bacillus; 3 or 4 of the commercial Bulgarian bacillus tablets are then dissolved in 1 ounce (30 c.c.) of sterile water, well stirred, and injected into the bladder, the patient being told to retain the fluid as long as possible. This process repeated for 3 days will usually, the author says, transform an offensive alkaline urine into an acid one, with corresponding amelioration of symptoms.

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surgical treatment in, iii. 723
urotropin in, iii. 720
uva ursi in, viii. 762
Vichy water in, iii. 721
chronic, iii. 714
ammonium chloride in, i. 620

In the cystitis of aged women, F. R. Charlton (Surg., Gynec., and Obstet., Oct., 1916) emphasizes the importance of the best general care and hygienic control. The usual **hot boric irrigations** are quickly beneficial. **Argyrol** in instillation is helpful. The rectal and vaginal irritation can perhaps best be met by the **hot alkaline douche**, the interval of douching being gauged by the comfort obtained. Pure liquid **guaiacol** internally is valuable. It almost invariably brings remarkable and quick relief from the frequency of urination with tenesmus and burning, when given in 5- to 10-drop doses after each meal.

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White's operation in, iii. 725
subacute, buchu in, ii. 694
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tuberculous, formaldehyde in, iv. 735
Cystocele, viii. 723

To preserve the anatomic rhaphé of the vagina and avoid both injuring the bladder during the incision and subsequent mishaps, Carvallo (Chronica Medica (Lima), Apr., 1917) makes 2 incisions, 1 on each side. The support from the normal rhaphé and from the strips of cicatricial tissue is very efficient.

Smith (Boston Med. and Surg. Jour., Apr. 26, 1917) supports the bladder in certain cases by attaching the uterus to the posterior inferior surface of the bladder, the cervix being sutured firmly to the posterior wall of the urethra, just above and behind the meatus. The bladder is thus held in the pelvis, the bladder resting on the anterior wall of the uterus.

Cystocele (*continued*).
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in women, viii. 723
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Edebohls's method in, viii. 771
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Cystoscopy, viii. 675
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preparation of patient for, viii. 676
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technique of, viii. 676
uses of, viii. 677
varieties of cystoscope in, viii. 675
Cystostomy, i. 98
in hypertrophy of the prostate, viii. 714
Cystotomy, sacral anesthesia in, viii. 216

In all clean suprapubic cystotomies C. Potter (Chicago Med. Recorder, xxxviii, 665, 1916) uses a transverse incision through the skin and fascia; divides the recti and pyramidales longitudinally; pushes the peritoneum from the bladder fundus; and makes a high transverse incision in the bladder, which later is closed with a modified Connell intestinal suture for the inner layer down to the mucosa, reinforced with continuous chromic catgut suture. A median incision is better in cases requiring protracted drainage or with much cystitis. Air is used to distend the bladder after the incision is completed down to the bladder. Where there is much cystitis or retention he favors the 2-stage method.

In suprapubic cystotomy for the purpose of prostatectomy, removal of a vesical growth, or retrograde catheterism, A. R. Thompson (Lancet, May 26, 1917), after the diseased tissue has been removed and hemorrhage checked, fills the bladder with gauze sponges saturated with hot boric solution at 120° F., and later pours in hot liquor hamamelidis, B. P., 3 ounces (90 c.c.). A coudé catheter is then inserted into the bladder via the urethra, ⅓ up the vertical height of the organ and its relation to the meatus carefully noted. The bladder wound previously protected with cyanide gauze, is then exposed, fine catgut sutures placed through the muscle wall as close to the mucous membrane as possible, but not through it, and the fibrous and outer muscular coats of the bladder then secured with thicker catgut Lembert sutures. A small gauze wick is placed in the space of Retzius, after washing of the latter with boric solution. The peritoneum, retracted upward, is brought back in front of the bladder and the abdominal wall sewn up with 2 rows of catgut.

A. H. Peacock (Surg., Gynec. and Obstet., Sept., 1916) in closing the bladder, recommends a purse-string suture, inserted before the bladder is punctured. It prevents extension of the incision by ripping; makes final suturing of the bladder unnecessary; saves time; checks bleeding from the large external veins of the bladder, and makes a dry, urine-free wound.

- perineal, **beta-eucaine infiltration anesthesia** in, iv. 702
- simple, i. 98
- suprapubic, **cocaine anesthesia** in, iii. 484
  - **infiltration anesthesia** in, iii. 497, 498

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  - of the peritoneum, vii. 396
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- mesenteric, vii. 396
- of conjunctiva, iii. 588
- of ears, iv. 712
- of frontal sinus, viii. 153
- of liver, i. 97
- of maxillary sinus, viii. 147
- of mediastinum, viii. 551
- of pancreas, vii. 293
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- of peritoneum, vii. 395
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- of salivary glands, viii. 61
- of spleen, viii. 307, 315
  - **surgical measures** in, i. 93
- of stomach, viii. 395
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- of tongue, viii. 567
- of urethral glands, viii. 703
- of vagina, viii. 774
- omental, vii. 396
- ovarian, vii. 250
- parovarian, vii. 254
- sebaceous, viii. 165
  - **electrolysis** in, iv. 421
- superficial, **cocaine anesthesia** in excision in, iii. 491
  - **novocaine anesthesia** in, vii. 103
- suppurating, **oxygen** in, vii. 275
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  - **hot applications** in, vi. 238
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  - **bacterial vaccines** in, ii. 418
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  - **calomel** in, vi. 240
  - **chloretone** in, iii. 219
  - **collargol ointment** in, iii. 534

Extirpation of the lacrymal sac resorted to by J. Garcia del Mazo (Revista de Med. y Cir. Pract., Apr. 21, 1916) in 50 cases. These demonstrated its certainty of cure, the rapidity of results (no case taking over 14 days to clear up) and painlessness. The scar is so small as to be almost imperceptible in almost all cases and the resultant lacrymation is insignificant.

  - **hot applications** in, vi. 240
  - **hydrogen dioxide** in, v. 573
  - **incision** in, vi. 240

C. M. Cobb (Boston Med. and Surg. Jour., Aug. 6, 1914) reports a case in which the systematic injec-

tion of tincture of iodine into the lacrymal sac was used with the final result that the latter became apparently obliterated, although the patient thought that tears passed through the duct.

iodoform in, vi. 54
lead style in, vi. 240

J. Fernandez (Rev. de Med. y Cir., xxi, 141, 1916) highly recommends massage of the sac in congenital dacryocystitis, applied continuously and by digital pressure.

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Dacryops, vi. 238
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Daland's test for indican, v. 648
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Dandruff, see Pityriasis, vii. 477
Dandy fever, see Dengue, iii. 783
Davy's method in urea determination, viii. 673
Dawbarn's method of intra-arterial infusion, v. 682
Dawson's solution, viii. 200
Deaf-mutism, iii. 727

N. J. P. Van Baggen (Med. Rec., May 23, 1914) states that the oral systems are supplanting the sign system, there being now scarcely an institute where the latter is taught. The oral system allows its pupils to hold intercourse with every one, instead of only with other deaf mutes. Further, the sign and manual language is purely artificial, while the oral system attempts the restoration of normal speech. It tries to take advantage of the remnant of hearing which many deaf and dumb possess.

Hysterical mutism, according to G. Hudson-Makuen (N. Y. Med. Jour., May 27, 1916), is usually of sudden origin and the result of some severe psychical or emotional shock. It differs from hysterical aphonia in that the former evinces a more extended disability of the mechanisms of speech, and it differs from aphemia or motor aphasia in that the mutism is absolute. The treatment may be either brusque in character or gentle and persuasive. An effort should always be made to "scare back" the voice, and then by psychophysical training to re-establish correct methods of speech, but failing in this treatment, milder educational measures should be used, viz., suggestion, persuasion, and re-education.

aural exercise in, iii. 759
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impacted cerumen, removal in, iii. 757
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lip reading in, iii. 759
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removal of adenoids in, iii. 757
tongue gymnastics in, iii. 759
treatment of aural or nasal disorder in, iii. 756
vibration of vocal cords in, iii. 759
Deafness, v. 684

Got (Birmingham Med. Rev., from Jour. of Laryn., Sept., 1916) states that injury to the internal ear by air conduction is caused by shells bursting within a distance of at the most 16 feet. Beyond that distance any labyrinthine disturbance is likely to disappear rapidly. Injury to the inner ear also occurs directly, or through bone conduction from the other side, by fracture of the petrous bone with partial or complete destruction of the perceptive organ. Deep wounds of the head occur without injury to the labyrinth, while, on the other hand, serious labyrinthine disturbance results from "shell wind." Patients with healthy ears seem more often the subjects of injury to the labyrinth than those whose ears previously were defective. The sudden displacement of the labyrinthine fluids accounts for the slighter cases, and in the more severe there are hemorrhages with detachment and disintegration of the membrane of Corti.

In all cases deafness is present, which diminishes rapidly or persists for months, and sometimes remains probably incurable. He has never seen it increase. Tinnitus is usually persistent, and vertigo generally quickly disappears. The presence of

spontaneous nystagmus is considered essential in the diagnosis of traumatic labyrinthitis when the lesion is under a duration of several months. Unless there is complete destruction of the labyrinth the nystagmus is toward the healthy ear. Disturbance of equilibration occurs, and is usually the first symptom to disappear. It is not found in slight cases or in those of long duration. The usual labyrinthine tests are used to diagnose chronic cases where there is no direct evidence of labyrinthine trouble. The organic cases are to be distinguished from hysteria and malingering. Treatment is by **absolute rest. Bromide**, 15 to 30 grains (1 to 2 Gm.), and **iodide**, 5 to 10 grains (0.3 to 0.6 Gm.), daily. **Counterirritation** over the **mastoid** and **leeches. Light diet. Lumbar puncture** in severe vertigo.

Nearby shell explosion is one of the commonest causes of deafness in military practice. Such deafness, according to I. Ranjard (Bull. de l'Acad. de méd., Sept. 12, 1916), may be neuropathic when the result of functional inhibition of the centers of auditory sensation or identification. The organic form is associated either with otitis media, labyrinthine concussion, or auditory neuritis.

To detect simulation of deafness, Gossett (Prog. méd., Jan. 13, 1917) tells the patient to give the sound "Ah" as high as he can and then continue it down as low as he can. The truly deaf stop when they reach the point below which they cannot hear their own voice, while the simulator continues to the base of the scale.

According to Lannois and Chavanne (Lyon méd., Feb., 1916), complete recovery occurs in a large proportion of cases. In a series of 1000 men in his special service there was deafness in 645 due to concussion or commotion of the internal ear without direct traumatism. Recovery occurred in 98 per cent., the remaining 2 per cent. being left permanently deaf in both ears.

Regarding other conditions, based on 189 other cases, purulent otitis media became aggravated by camp life, and the injury from a shell wound caused complete deafness. The hearing was retained in only 5.2 per cent. of 38 men wounded in the mastoid region.

Haenlein (Med. Klinik, May 30, 1915) in advocating training in **lip reading** for deaf soldiers, also states that the number of soldiers rendered irreparably deaf by war injuries is not large proportionally. The hearing is generally recovered, on 1 side at least. The cases of more or less total deafness are usually traceable to a traumatic neurosis, hysteria or direct injury of the internal ear.

salvarsan in, iv. 209
thiosinamine in, viii. 530
due to inflammatory disease of labyrinth, **pilocarpine** in, vii. 472
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tampon in, v. 690
syphilitic, **pilocarpine** in, vii. 472
tuning-fork tests for, v. 684
Deansley's technique in hernia, v. 473
Death, dread of, **hypnotherapy** in, viii. 421
Death tests.

Two death tests are very useful, according to an editorial (La Clinica Medica Ital., Mar., 1915): A drop of ether is instilled into the conjunctival sac of 1 eye, the other being used as control. Reddening of the conjunctiva affords proof that life still exists. The second, d'Halluin's, consists in passing a stylet to the heart through a small incision in 1 of the intercostal spaces. Any movement in the heart is communicated to the stylet. This may induce cardiac activity by gentle movements of the stylet, combined with artificial respiration.

D. Massana (Rev. de Med. y Cir. Pract., Sept. 21, 1916) gives an infallible sign of death introduced by Lecha Marzo, of Granada. It consists of an acid reaction of the tears, blood, and organs coming on immediately after death and may be readily tried by introducing a piece of blue litmus paper under the eyelid.

According to Zsako (Münch. med. Woch., Jan. 18, 1916), tapping with the hammer on certain muscles elicits a reflex contraction up to from 90 to 240 minutes after death. The contraction can be elicited in the same way on the living, but it is more pronounced in the cadaver as there is no antagonistic tonus.

- Deaver's incision in appendicitis, ii. 106
- Deciduoma malignum, i. 178; vii. 250
- Decortication of the lung, iii. 188
- Degeneration of the heart, see Heart, Degenerative Disorders of, v. 28
- Delafield's hematoxylin stain, v. 378
- Delhi boil, see Oriental Sore, vii. 213; also this Index.
- Delirium, **chloral hydrate** in, iii. 208
  - **musk** in, vi. 773
  - acute, see Insanity, Acute Confusional, vii. 696
    - **anhalonium Lewinii** in, i. 700
  - acute alcoholic, see Alcoholic Delirium, Acute, i. 560
  - degenerative, **sodium nucleinate** in, vii. 110
  - of infectious diseases, **scopolamine** in, viii. 102

In the treatment of delirium, according to E. L. Hunt (Med. Rec., July 31, 1915), the effect of a drug may be the opposite of that intended. The **hot bath,** at 90° to 95° F., is one of the best means at our disposal. If this is not practicable the **wet pack** is the best substitute, applied for an hour. A delirious patient should be put to bed at once and kept there. **Liquid nourishment** in the form of egg and milk should be given constantly and persistently. Close attention should be paid to the heart action.

[The hot pack is contraindicated in acute alcoholic delirium. C. E. de M. S.]

- of persecution.

Since the beginning of the war, J. Lépine (Bull. de l'Acad. de méd., Nov. 21, 1916) has had under observation many cases of actual persecutory delirium, entered into much more rapidly than is normally the case. Removed at once from the depressing action of danger, insomnia, watching at night, and artillery concussion, they sometimes regained their mental balance. This tends to show that it is the persistence of the causes which is responsible for the incurability of the latter in civil practice. Removal from harmful influences is, to be sure, less difficult to accomplish in those subject to military discipline.

- tremens, i. 560; see also Alcoholism, Acute, this Index.
- uremic, see Uremia, viii. 668
- Delorme's method of resection of ribs, v. 283
  - technique in chronic pleurisy, iii. 188
- Dementia, Abderhalden test in, v. 391

Cotton (Jour. of Exper. Med., Oct., 1915) concludes that in all pathologic processes of the cortex which end in dementia and death, fatty degeneration plays a not unimportant part. In senile dementia and dementia precox the fatty substance appears to fill completely the cell body, and these cells have apparently lost all function.

- consecutive, vii. 691
- epileptic, vii. 693
  - **creosote carbonate** in, vii. 694
  - **lactic acid bacillus** in, vii. 694
  - **laxatives** in, vii. 694
  - **menthol** in, vii. 694
  - **saline rectal irrigations** in, vii. 694
  - **salol** in, vii. 694
  - **thyroid gland** in, vii. 694
- paralytica.
  - **methylene blue** in, vi. 686
  - **salvarsan** in, iv. 214

Massarotti (Il Policlinico, Sept., 1915) tried **neosalvarsan** in 10 more cases and found it effective in the incipient stage of the disease before destructive lesions have begun.

Houckgeest (Nederland. Tijdsch. voor Geneesk., Feb. 3, 1917) regards **tuberculin** treatment as promising in treatment of not too far advanced paralytic dementia, the leucocytosis enhancing the resisting power of the tissues to the spirochetes.

- precox, iii. 760

Symptoms, iii. 761.—Breiger (Med. Klinik, Jan. 31, 1915) states that the *lack of the normal play of the pupils* is characteristic, sometimes existing from the very first. Vasomotor disturbances, algesia and various reflexes were pronounced in all but 5 or 7.2 per cent. of his cases.

R. H. Steen (Jour. Mental Sci., Jan., 1916) has noticed what he deems a characteristic attitude in many cases of dementia precox, viz., when the patient is sitting, the arms are held close to the trunk with, as a rule, the elbow-joint in a condition of stiff extension and the hands in pronation, and resting on the lower part of the thighs, or even on the knees.

In a study of leucocytosis in dementia precox by Zimmerman (Zeit. f. d. ges. Neur. u. Psych., Nu. 3, 1914), normal values were seen in only 9 or 10 per cent. Quantitatively the findings showed an increase in the mononuclear elements generally at the expense of the neutrophilic cells. The eosinophiles sometimes reached 10 per cent. or over, and the large mononuclears 11 to 15 per cent. Mononuclear elements were frequently 30 to 40 per cent., and even reached 60 per cent. With a relative leukocytosis there is always a lymphocytosis.

W. Schmidt (Münch. med. Woch., Feb. 17, 1914) observed that cases of dementia precox, especially the catatonic and hebephrenic types, are not sensitive to injections of adrenalin, the blood-pressure not being affected.

Pathogenesis, iii. 779.—This phase of the question has received a new impetus, owing mainly to the close connection which the disease appears to have with the various ductless glands.

That the internal secretions play a rôle is probable, according to F. X. Dercum (Trans. Amer. Congr. Internal Med.; Med. Rec., Jan. 20, 1917). Sajous has pointed out the cogent facts indicating an important rôle played by the thymus gland. In keeping with the view he presents are not only the facts pointing to a defective nervous development, but also the observations of Barbo and Habderkandl of the occurrence of osteomalacia in dementia precox. Various facts point to other structures as well. Occasionally the thyroid gland is enlarged; more frequently small. Thus in 7 autopsies 5 thyroids were little more than ½ the normal weight, 1 was ¼, and 1 was approximately normal. Out of 8 pairs of adrenal glands, 5 were greatly in excess, 1 decidedly below normal, and 2 about normal. The most constant finding in the adrenal picture was the small amount of fat in the cells of the cortex. Clinically his attention has been strongly attracted to the sex glands, the anomalies of menstruation, the delayed and imperfect establishment of puberty on the one hand, or of sexual precocity on the other. Again, there was a history of sexual excesses, sexual vagaries, and perversions. A relation to the sex glands is further indicated in the accentuation of the symptoms often observed during the menstrual epoch and by the occasional incidence in a pregnancy, in repeated pregnancies, or in a miscarriage, as though sex exhaustion played a rôle.

In a study of the metabolism of 5 cases of dementia precox, Ross (Arch. of Internal Med., June, 1914) concluded from the sulphur data that in all these cases the patients had lost to a certain degree their normal powers of oxidation. Findings with regard to phosphorus, calcium and magnesium were negative.

Frankhauser (Correspondenzbl. f. schweizer Aerzte, Jan. 17, 1914) found microscopic changes in the brain in dementia precox which he attributes to abnormal functioning of certain ductless glands, especially the thyroid and genital glands.

Abderhalden test in, v. 391, 392

On the basis of this reaction, A. Fauser (Deut. med. Woch., Feb. 13, 1913) concludes that in the majority of the cases of dementia precox, especially in the hebephrenic type, there is an imperfect functioning of the reproductive organs, and in the catatonic excitement stage, of the thyroid.

In a study of the Abderhalden tests in 289 cases by Cotton, White and Stevenson (Jour. Nerv. and Mental Dis., Feb., 1917) the findings in dementia precox were positive to sex gland in 46 out of 58 cases tested, or 81 per cent., and in 9 cases negative. Blood-counts in dementia precox gave wide deviations from the normal. The leucocytes were low, in one case 2100 per c.c., and averaging about 6500. Coupled with this was usually a slightly increased pulse rate with low blood-pressure and subnormal temperature. Notable was the fact that 75 per cent. died of tuberculosis.

treatment of, iii. 781.
arsenic trioxide in, vii. 676
brisk purge in, iii. 781
catheterization in, iii. 781
enemata in, iii. 781
forced feeding in, iii. 781
hyoscine in, iii. 781
lecithin in, iii. 781, 782
mental treatment in, iii. 782
morphine in, iii. 781
partial thyroidectomy in, iii. 782, 783
sodium cinnamate in, vii. 676
nucleate in, vii. 110, 676

Bayard Holmes (Chicago Recorder, Sept., 1915) recommends **sodium nucleate**, previously advocated by Donath and Lundvall, to increase the germicidal power of the blood. In a more recent paper the author (Western Med. Review, Sept., 1916) suggests that the putrefactive amines developed in the intestine are the pathogenic factors of the disease. He therefore advocates besides the nucleinates, foods and beverages with **calcium** and **magnesium** to combat the spasmophilic condition, and further, that the formation and absorption of the amines in the cecum be prevented by **cecal lavage** through an **appendicostomy**. This lavage should be given at bedtime and six hours after the last meal of the day. The lavage solution should consist of half a cake of dry yeast, deaminizing the toxic bodies and preventing their formation, emulsified in water and strained through gauze, 15 Gm. (3¾ drams) of glucose, and water to make 4 liters (quarts). The fluid should be introduced at 104° F. (40° C.), and the patient encouraged to evacuate each time the rectum fills.

thymus gland in, vii. 676

In a study of dementia precox, Ebbell (Norsk Mag. f. Laegen., Dec., 1914) made observation that the pathologic findings in dementia precox seem identical with those found in animals after partial destruction or total removal of the thymus. Attempts to treat animals and human beings with thymus extract or in substance gave no results. **Transplantation of thymus tissue** is advised, although Klose and Vogt have reported eventual absorption in 2 dogs in which scraps of thymus tissue had been implanted in the omentum and spleen, both animals having been thymectomized.

Ludlum and Corson White (Amer. Jour. of Insanity, Apr., 1915) studied the blood-pressure in dementia precox patients in 2 positions, standing and reclining. The ordinary rise in blood-pressure of 8 to 10 mm. when the patient is standing was found to be absent in cases of dementia precox and in many of these patients there was an actual fall almost exceeding the normal rise above the blood-pressure when the same patient was reclining. They recognize, therefore, 2 clinical groups of dementia precox, one attended with a low blood-pressure and a negative Abderhalden reaction to testicle and pancreas, the other positive Abderhalden reaction and a high blood-pressure. They then administered **thymus extract** in cases showing high blood-pressure and giving the Abderhalden reaction. Out of 6 cases, 3 gave excellent results, the patients being well at the time of publication. Disappearance of the attitude blood-pressure paradox was also noticed.

thyroid gland in, i. 743; iii. 781, 782; vii. 676

When dementia precox develops during puberty, according to Lemel

(Nederlandsch Tijd. v. Geneesk., July 25, 1914), the thyroid gland is deficient in many cases. He found that it subsided under **thyroid treatment** in 11 of the 12 cases, men from 17 to 24, the others girls of 19 to 21. The improvement in 8 was striking.

thyroidectomy, partial, in, vii. 676
warm bath in, iii. 781
senile, vii. 692
intestinal antiseptics in, vii. 693
opium in, vii. 693
organotherapy in, vii. 693
paraldehyde in, vii. 693
purgatives in, vii. 693
sex gland implantation in, vii. 360
trional in, vii. 693
Demineralization of the organism, **phosphoric acid** in, vii. 449
Dendritic keratitis, see Keratitis, Dendritic, iii. 651; also this Index.
Dengue, iii. 783

Khoury (Bull. et mém. de la Soc. méd. des Hôp. de Paris, Nov. 13, 1913) holds that in but few acute diseases is the symptomcomplex of adrenal insufficiency so frequently—in fact, almost regularly—encountered as in dengue or breakbone fever: Profound asthenia, sometimes sudden in onset, but almost constant; lumbar and especially epigastric pain and tenderness, and vomiting, sometimes incessant, together with fever and various neuralgic pains, may be cited as the fundamental symptoms of the disease. Of 7 cases studied in Syria in 1912, all gave, with great clearness, the "white line" phenomenon of Sergent. Three rapidly improved under 30 drops of a 1:1000 solution of **adrenalin** by the mouth, and the white line could no longer be elicited thereafter.

acetanilide in, iii. 790
ammonium acetate in, iii. 790
anodyne liniments in, iii. 790
belladonna in, iii. 790
bromides in, iii. 790
caffeine citrate in, iii. 790
chloral hydrate in, iii. 790
cholagogues in, iii. 789
codeine in, iii. 790
cold sponge-bath in, iii. 790
diet in, iii. 789, 790
Dengue (*continued*).
ether (nitrous) spirit in, iii. 790
gelsemium in, iii. 790
hematics in, iii. 790
hot fomentations in, iii. 790
hot mustard foot-bath in, iii. 790
hydrotherapy in, iii. 790
ice-cap in, iii. 790
morphine in, iii. 790
mountains in, iii. 790
neutral mixture in, iii. 790
oleum ricini in, iii. 790
phenacetin in, iii. 790
potassium iodide in, iii. 790
purgatives in, iii. 789
quinine in, iii. 790
salicylic acid compounds in, iii. 790
seashore in, iii. 790
sulphonal in, iii. 790
tonics in, iii. 790
water freely in, iii. 789
Dental anesthesia, **chloral hydrate** in, iii. 211
ethyl bromide in, iv. 694
caries, **hydrogen dioxide** in, v. 571

H. P. Pickerill (Brit. Med. Jour., June 27, 1914) concludes that the thyroid, pituitary, and thymus glands may, by deficient secretion, be capable of reducing the resistance of the teeth to caries, it being possible that each of these glands pour into the circulation substances which affect calcium metabolism and utilization, and which might be called "osteogenetic" or "dentogenetic" hormones.

hypophosphites in, vii. 450
lactophosphates in, vii. 450.
orthoform anesthesia in, vii. 216
phenol in, vii. 442
hemorrhages, **antipyrin** in, ii. 46
pain, **cannabis indica** in, iii. 8
tannin in, viii. 498
pulp, inflammation of, **iodine tincture (dental)** in, vi. 41
surgery, **eugenol** in, iii. 462
Dercum's disease, see Adiposis Dolorosa, i. 412; also this Index.
Dermal Leishmaniasis, see Oriental Sore, vii. 213; also this Index.
Dermatitis, iii. 791
acetic acid in, i. 230
aluminum acetate in, i. 588
alumnol in, i. 591

Dermatitis (*continued*).
    - atropine in, ii. 451
    - sodium bicarbonate in, viii. 189
- calorica, iii. 792
- exfoliativa chronica, atoxyl in, ii. 262
    - epidemic, iii. 807
        - carbolic acid in, iii. 807
        - codliver oil in, iii. 807
        - creolin baths in, iii. 807
        - creolin ointment in, iii. 807
        - olive oil in, iii. 807
        - warm baths in, iii. 807
    - general, iii. 806
        - aperients in, iii. 806
        - bland ointments in, iii. 806
        - codliver oil in, iii. 806
        - Lassar's paste in, iii. 807
        - saline diuretics in, iii. 806
        - starch glycerite in, iii. 807
    - local, iii. 807
        - carbolic acid ointment in, iii. 807
        - Lassar's paste in, iii. 807
        - salicylic ointment in, iii. 807; viii. 58
        - sulphur in, iii. 807; viii. 431
    - of infants, acute, iii. 805
        - almond (sweet) oil in, iii. 806
        - bran baths in, iii. 806
        - calomel in, iii. 806
        - cool baths in, iii. 806
        - slightly astringent baths in, iii. 806
        - sufficient nourishment in, iii. 806
- gangrenosa, iii. 802
    - antiseptic lotions in, iii. 803
    - ichthyol in, iii. 803
    - iodine in, iii. 803
    - pyoktanin in, iii. 803
- herpetiformis, iii. 798
    - antipyrin in, iii. 801
    - arsenic in, ii. 142, 144, 262; iii. 801
    - blood-picture in, v. 384
    - cannabis indica in, iii. 801
    - chloral in, iii. 801
    - cocaine ointment in, iii. 801
    - hot baths in, iii. 801
    - opium in, iii. 801
    - phosphorus in, iii. 801
    - quinine in, iii. 390
    - strychnine in, iii. 801
    - sulphur ointment in, iii. 801
    - tar in, iii. 801
    - thyroid gland in, i. 734; iii. 802
- intertriginous, iii. 792
    - black wash in, iii. 792
    - calomel ointment in, iii. 792
    - Lassar's paste in, iii. 792

Dermatitis, intertriginous (*continued*).
    - salicylic acid in, iii. 792
    - starch in, iii. 792
    - vaselin in, iii. 792
    - zinc oxide in, iii. 792
- maligna, iii. 803
    - acacia in, iii. 805
    - arsenic acid in, iii. 805
    - arsenical paste in, iii. 805
    - caustics in, iii. 804
    - chromic acid paste in, iii. 805
    - galvanocautery in, iii. 805
    - lactic acid in, iii. 805
    - Marsden's paste in, iii. 805
    - pyrogallic acid ointment in, iii. 805
    - removal of growth in, iii. 804
    - thermocautery in, iii. 805
    - X-rays in, iii. 804, 805
    - zinc chloride paste in, iii. 805
- medicamentosa, iii. 796
- paraphenylendiamine.

Several cases of dermatitis due to paraphenylendiamine were observed by Bunch (Brit. Jour. Dermat., Sept., 1915). The dermatitis was severe and resembled weeping eczema, and was located upon the scalp and face. The paraphenylendiamine had been used in a hair dye. The dermatitis may spread to the chest and back.

Olson (Jour. Amer. Med. Assoc., Mar. 18, 1916) reports 5 instances of severe dermatitis due to the wearing of dyed furs. It is especially caused by the fur collars. Since the selling of furs dyed with paraphenylendiamine is not prohibited by law, a label should be attached stating that it has been used.

F. C. Knowles (Med. Rec., July 29, 1916) observed that the symptoms of intoxication from paraphenylendiamine and other poisonous aniline dyes, may be divided into (1) toxic eruptions, dermatitis and urticaria; (2) gastrointestinal symptoms, such as nausea; (3) nervous symptoms, sleeplessness, dizziness, weakness of the legs, epileptiform attacks, and syncope. In several instances death has resulted; also retrobulbar neuritis with impairment of central vision and a central scotoma for red and green have been observed. Aurantia or hexanitrophenylamin, used in the staining of cheap yellow shoes, may also cause an outbreak of dermatitis.

professionalis, vi. 781
seborrheic, sodium biborate in, viii. 430
  sulphur, precipitated, in, viii. 430
  salicylic acid in, viii. 430
traumatica, iii. 791
  cold cream in, iii. 792
  hot-water applications in, iii. 792
  vaselin in, iii. 792
  zinc oxide ointment in, iii. 792
venenata, iii. 792

E. Rost (Med. Klinik, Jan. 18 and 25, 1914) referring to rhus toxicondendron poisoning, states that the poisonous resin exists in the root, stem, branches, leaves, stamens and pistils, in fact in all parts of the plant except the pollen and flowers. Peculiar follicles in the leaves and hairy corymbs of the fruit secrete it, and touch is necessary to cause the dermatitis. The dry resin is poisonous, soluble in alcohol and has a special affinity for the arteries of the skin.

  aconite in, iii. 796
  adrenalin chloride in, iii. 796
  alcohol in, iii. 794, 796
  alcoholic lead acetate in, vi. 314
  alkaline hot bath in, iii. 796
  benzin in, iii. 794
  bismuth subgallate in, iii. 796
  black wash in, iii. 794
  boric acid in, iii. 794, 795

J. E. Lane (Med. Rec., Sept. 11, 1915) recommends constant moist dressings of ice cold boric acid solution. The larger blebs are opened, but the smaller ones are not touched. Ointments should be avoided in the acute stage.

  bromine in olive oil in, iii. 794
  calomel in, iii. 796
  carbolated zinc ointment in, iii. 794
  carbolic acid in, iii. 796
  carron oil in, iii. 795
  chalk in, iii. 796
  cotton gloves in prophylaxis of, iii. 793
  cream of tartar in, iii. 796
  ether in, iii. 796
  ethereal soap solution in, iii. 796
  gelsemium in, iii. 796
  glycerin in, iii. 794

Dermatitis, venenata (*continued*).
  goggles in prophylaxis of, iii. 793
  grindelia robusta in, iii. 796; v. 143
  ice-cold compresses in, iii. 795
  ichthyol in, iii. 794
  ipecac in, iii. 796; vi. 61
  lanolin in prophylaxis of, iii. 793
  lead acetate in, iii. 795, 796; vi. 314
  lead and opium wash in, iii. 795; vi. 314
  lime water in, iii. 794, 795, 796
  lobelia in, vi. 437
  lycopodium in, iii. 796
  magnesium carbonate in, iii. 795
  magnesium sulphate in, iii. 796, vi. 476
  morphine in, iii. 796
  orris root in, iii. 796
  potassium permanganate in, iii. 795, 796
  resorcin in, iii. 794
  soap and water in, iii. 794, 795, 796
  sodium bicarbonate in, iii. 795, 796; viii. 189
  sodium, chlorinated, in, viii. 189
  sodium hyposulphite in, iii. 794; viii. 189
  starch in, iii. 796
  thymol iodide in, iii. 795
  wax in prophylaxis of, iii. 793
  white petrolatum in, iii. 796
  yellow oxide ointment in, iii. 796
  zinc oxide in, iii. 794, 795, 796
  zinc sulphate in, iii. 796
wounds and sinuses.

Prophylaxis.—In war dermatitis prophylaxis consists in interrupting the use of antiseptics when the patient begins to complain of local itching, and in protecting the cicatricial margin of the sinus from antiseptics by application of a zinc oxide paste after each treatment of the sinus:

℞ *Zinci oxidi,*
  Adipis lanæ hydrosi ....āā ʒiss (6 Gm.).
  Petrolati .... ʒij (8 Gm.).
M. Fiat unguentum.

Treatment of the established dermatitis, according to Desaux (Presse méd., Mar. 30, 1916) after removing scales with moist dressings, consists in tearing off any remaining epidermis and applying to the entire affected area, with special care at its periphery, a 1 per cent. solution of silver nitrate followed by Credé's ointment or a 10 per cent. ointment of collargol. The silver solution should then be increased to 2, and even 5, per cent. After a few days, the affected area has been disinfected, but is still infiltrated, red, shining, and weeping. At this stage the following is used:—

℞ *Picis carbonis loti* . gr. xv (1 Gm.).
Ichthyolis .... ʒss (2 Gm.).
Zinci oxidi,
Adipis lanæ hydrosi ....āā ʒiss (6 Gm.).
Petrolati .... ʒij (8 Gm.).
M. Fiat unguentum.

Five or six days later the area should be completely dried by painting with washed coal tar, to be left on forty-eight hours. The tar-ichthyol ointment should then be reapplied. To prevent extension, the healthy surrounding skin should be kept covered with the following:—

℞ *Camphoræ pulveris* .... gr. xiiss (0.75 Gm.).
Acidi borici,
Ichthyolis ..āā gr. xv (1 Gm.).
Zinci oxidi,
Adipis lanæ hydrosi ..āā ʒiss (6 Gm.).
Petrolati ..... ʒij (8 Gm.).
M. Fiat unguentum.

X-ray, adrenalin in, i. 774
light therapy in, vi. 363

E. W. Caldwell (Jour. Amer. Med. Assoc., Oct. 10, 1914) states that for chronic X-ray lesions which are still strictly cutaneous, radium treatment is the most practical, easy, and painless. The electric sparks can sometimes be applied in situations impossible to reach with liquid air or carbon dioxide snow, which are somewhat less painful. The value of surgery in such cases has been fully shown, but these operations are dangerous, and call for rare judgment and skill. The possibility of hastening metastasis must be considered.

For acute X-ray dermatitis, W. J. Dodd (Jour. Amer. Med. Assoc., Oct. 10, 1914) suggests the following:—

℞ *Zinci oxidi* ...... 30 Gm. (1 oz.).
Phenolis .... 2 c.c. (½ dr.).
Glycerini .... 4 c.c. (1 dr.).
Aquæ calcis ..... 240 c.c. (8 oz.).

Shake well and bathe area for 5 to 10 minutes, 2 or 3 times a day. Avoid all heavy dressings, and, when possible, expose the lesion to the air. Allow to remain for 5 to 10 minutes. Under no conditions use ointments.

Dermatology, Abderhalden test in, v. 392
Dermatomycosis favosa, v. 158
Dermatomyositis, see Polymyositis, Acute, vi. 734
Dermoids of anus, cocaine in, iii. 490
of conjunctiva, excision in, iii. 587
of Fallopian tubes, vii. 249
of orbit, vii. 211
of peritoneum, vii. 396
of spleen, viii. 315
of stomach, viii. 395
sublingual, viii. 567
Deshler's salve, see Turpentine, viii. 632
Desiccation by high frequency, iv. 428
D'Espine's sign, viii. 550

Morse (Amer. Jour. Dis. of Child., Apr., 1916) concludes, after a study of 666 children among the well-to-do, that D'Espine's sign may be said to be present when the bronchial voice or whisper is heard below the 7th cervical vertebra. This sign he found present in only 6 per cent. of cases. The sign is probably not a manifestation of tuberculosis in more than one-half the instances in which it occurs.

Desquamative nephritis, chronic, see Nephritis, Chronic Exudative, ii. 609; also this Index.
Detachment of the retina, see Retina, Detachment of, vii. 203; also this Index.
Devil's apple, see Stramonium, viii. 406
de Wecker's operation in lachrymal stricture, vi. 242
Dew's method of resuscitation, vi. 460, 461
Diabetes, bronzed, iv. 13, see also Chromatosis.
Diabetes insipidus, iv. 1

Cushing (Boston Med. and Surg. Jour., June 19, 1913) concluded that the infundibular region secreted a hormone capable of giving rise to diuresis. Sajous had previously (1907) pointed out that the pituitary body sent sympathetic nerves to the kidneys, and that excitation of the pituitary increased renal activity. Hoppe-Seyler (Münch. med. Woch., Nov. 30,

1915) concludes that diabetes insipidus is not due to any one special lesion, but to a vasomotor disturbance from different causes. He thinks that most certainly the kidney is not at fault. In his patient marked improvement was evident from the use of **pituitary extract** subcutaneously, though not when taken by mouth.

Kleeblatt's case, in which diabetes insipidus developed after an accident injuring the skull, is mentioned by Hoppe-Seyler (Münch. med. Woch., Jan. 11, 1916). Under **pituitary extract**, the polyuria subsided, but the thirst and excessive sweating persisted. The hypophysis was found intact, the trouble being from chronic irritation of the floor of the fourth ventricle. He concludes that when pituitary extract modifies the whole clinical picture, as in his case, this can be accepted in differential diagnosis of a pituitary affection.

Motzfeldt (Boston Med. and Surg. Jour., May 4, 1916) found that feeding the patient with the **posterior lobe of the pituitary body** checked the diuresis, while administration of the anterior lobe had no such effect.

Marañon (Siglo Medico, Jan. 20, 1917) mentions that in a boy of 13 the diabetes insipidus developed a few days after he had been shot in the head, the bullet lodging at the sella turcica and blocking the egress of the pituitary secretion. He voided up to 9 liters (quarts) of urine a day, but the amount dropped back to normal for 24 hours after injection of 1 c.c. (16 minims) of **pituitary extract.**

[The fact that the administration of pituitary gland checks diabetes insipidus is difficult to reconcile with Cushing's view that the disorder is due to a secretory product of the gland. The effect is explained in the light of my own view, by the fact that the pituitary extract, by causing constriction of the arterioles of the pituitary, diminishes its blood-supply and its functional activity. The kidneys receiving less violent impulses, their normal activity is correspondingly reduced. C. E. de M. S.]

Diabetes insipidus (*continued*).
  antipyrin in, iv. 7
  atropine in, iv. 7
  continuous current in, iv. 8
  diaphoretic measures in, iv. 8
  ergot in, iv. 7
  jambul in, vi. 92
  fluid restriction in, iv. 8
  gallic acid in, iv. 793
  iodide in, iv. 8
  lime water in, ii. 720
  lumbar puncture in, iv. 8
  mercury in, iv. 8
  potassium bromide in, iv. 7
  potassium iodide in, iv. 8
  strychnine in, iv. 7; vii. 150
  valerian in, iv. 7

Diabetes mellitus, iv. 8

Diagnosis, iv. 39.—Dünner (Therap. der Gegenwart, Apr., 1915) noted *transient loss of the pupil reflex* in a diabetic, an important diagnostic point for tabes and other affections with similar symptoms. He attributes it merely to toxic influence.

Blumer (Boston Med. and Surg. Jour., Jan. 13, 1916) states that *simulation of diabetes* may take 3 forms: (1) addition to the urine of sucrose; (2) glucose; (3) artificial glycosuria by taking phloridzin or phloroglucin.

Etiology, iv. 8.—C. von Noorden (Med. Klinik, Sept. 17, 1916), in a study of over 100 cases, finds that only 1 occurred in the reserves, the rest being among soldiers actively engaged at the front. The chief causes seemed to be increased physical efforts combined with poor living conditions and an improper diet. About 65 per cent. occurred in men who had not previously shown signs of diabetes, the remainder had had the disease in mild form or had shown some tendency to it. Proper care and diet usually removed the glycosuria sufficiently to restore the men to less active military duty. The most important index was the state of the blood-sugar. If this remained high after treatment the prognosis was not so favorable as if it fell fairly promptly to normal.

Complications, iv. 24.—Lichty (N. Y. Med. Jour., Aug. 28, 1915) states that there is little evidence in the literature showing that the ordinary infections are particularly fatal in patients having diabetes mellitus, with perhaps the exception of erysipelas, lobar pneumonia and pulmonary tuberculosis. An acute infection of the nasopharynx followed by an acute otitis or acute coryza were the starting point in 2 personal cases of a train of symptoms quickly fatal.

When the restricted carbohydrate diet upon which the patient usually maintained his weight and feeling of well-being is relaxed and replaced by a large general diet for pulmonary tuberculosis, the sugar eliminated invariably increases, and the chest signs become rapidly alarming. On the other hand, if the urine could be kept free from sugar, or nearly so, and the caloric value of the diet could be maintained at, or slightly above normal, the patients always improved.

Prognosis, iv. 46.—In a study of the mortality of diabetes mellitus in 1775 subjects Morrison (Boston Med. and Surg. Jour., July 13, 1916) found that the ratio of deaths from diabetes to the total number of deaths from all causes is 0.018 among Jews and 0.007 among non-Jews.

Of 945 cases of diabetes seen by E. P. Joslin (Amer. Jour. of Med. Sci., Mar., 1916) 921, or 97.5 per cent. were traced. Out of this number 425 had died. The actual causes of death were: 16 of cancer; 16 of pulmonary tuberculosis; 62 of cardiorenal and vascular changes, uncomplicated by coma; 36 from infections, pneumonia heading the list; 9 of septic and gangrenous legs; 4 of carbuncles; 2 of acute fulminating appendicitis. Coma was fatal to 273 cases (64.24 per cent.).

De Lange and Schippers (Neder. Tijd. v. Geneeskunde, Aug. 7, 1915) state that of the 500 or 600 cases of diabetes in children on record, recovery was mentioned as occurring in only about 30 of the 500 cases, and these were not traced long. The duration was from 8 or 9 months to 2 years and 5 months.

There exists, also, according to Riesman (Amer. Jour. Med. Sci., Jan., 1916) a *mild type of diabetes in childhood and adolescence.* It tends to occur in several members of the same family. The glucosuria is usually moderate, although nervous excitement and other disturbing factors may augment it. The disease is not progressive and may remain stationary or end in apparent recovery.

Addis (Jour. Amer. Med. Assoc., Apr. 3, 1915) does not concede the dangers of infection and non-healing in *operations on diabetics,* and holds that diabetic coma is the only real danger that deserves consideration. There can be no question of diabetic coma unless oxybutyric acid or its salts are found in large amounts. The degree of impairment of power to oxidize fatty acids is of prime importance in deciding whether or not operation is advisable, and a good functional test is needed. The inability of the kidneys to excrete large amounts of fatty acids is a factor. It is important to give **sodium bicarbonate** until the urine becomes alkaline, this to be maintained until after operation.

Etiology and pathogenesis, iv. 8, 18. —As stated by T. A. Benedict (Boston Med. and Surg. Jour., Apr. 13, 1916) there is no better way to realize the enormous change which has come about in our conception of diabetes than to trace the work recently done on the respiratory quotient, viz., the relation between the volume of CO_2 excreted and the volume of oxygen consumed. When the measurements are carefully made the ratio reads about 0.7. The respiratory quotient of fat is about 0.7, and of protein about 0.81. The respiratory quotient has to do chiefly with the metabolism of fats and carbohydrates.

R. T. Woodyatt (Jour. Amer. Med. Assoc., June 17, 1916) holds that the requisite for the abnormal accumulation of *acidosis* compounds is the rate of glucose utilization, and when for any reason the rate at which glucose is utilized in the body falls below a certain minimum, relative to the rate of fat and protein catabolism, the acidosis compounds appear. While acidosis develops in diabetes under the same fundamental conditions as in other persons, owing to the pancreatic insufficiency, the rate of glucose oxidization is lower than in health. To check acidosis one must restore the proper ratio by reducing the fatty acid metabolism to the rate at which glucose is oxidizing, and one must reduce both the protein and fat metabolism. Fasting, rest and warmth accomplish this.

Detection of acidosis.—Various tests for acidosis have been given under that head (see page 37, this Index). Hornor (Boston Med. and Surg. Jour., Aug. 3, 1916) found that normally the carbon dioxide tension varies between 38 and 45 mm. of mercury. Among diabetics with slight acidosis, it varies between 32 and 38 mm. of mercury; with moderate acidosis between 28 and 32; severe acidosis, less than 25. The lowest tension observed in a patient ultimately recovering from acidosis was 19 mm. The lowest observed was 9 mm. of mercury; this was in a comatose patient only a few hours before death.

Steensma and Koopman (Jour. Amer. Med. Assoc., from Nederland. Tijdsch. v. Geneesk., vol. lviii, No. 11, 1914) state that the *simple bedside technique* they describe will reveal even a slight acidosis. Five c.c. of urine is mixed with 2 or 3 drops of glacial acetic acid and 1 c.c. of a 0.5 per cent. solution of starch. Then 6 drops of 1 per cent. tincture of iodine is added. Normal urine then turns blue. When no blue tint is apparent, not even for a minute, the presence of diacetic acid is revealed. By graduating the tint in a set of test-tubes it is possible to estimate the degree of acidosis. It is not affected by the presence of albumin, sugar, acetone or urobilin.

J. T. Case (Jour. Amer. Med. Assoc., Sept. 16, 1916) in a Roentgenological study of the gastro-intestinal tract in 72 diabetics, found gall-stones in 8 per cent. In 8 more cases there were very suspicious shadows, some of which proved to be gall-stones at subsequent operations. Evidence of gall-bladder region adhesions existed in 26 of the cases. Duodenal stasis was rare.

E. P. Joslin (Boston Med. and Surg. Jour., Dec. 2, 1915) states that a number of statements in the literature of pregnancy and diabetes must be revised. Pregnancy in diabetes does not demand immediate abortion, even if acidosis is present. If pregnant diabetic patients are managed suitably, they will very likely abort less frequently. It cannot yet be accepted that pregnancy aggravates diabetes, and nursing is not contraindicated after confinements.

Warthin and Wilson (Amer. Jour. Med. Sci., Aug., 1916) show that a combined interlobular and interacinar type of pancreatitis with loss of the islands of Langerhans is localized and patchy, and more rarely severe and diffuse. It seems very probable that the latent syphilis is the main factor in the genesis of the pancreatitis frequently associated with diabetes, but that diabetes is not always coincident with severe degrees of this type of pancreatitis.

That the neural lobe of the pituitary plays an important part in carbohydrate metabolism has been observed by many, and finally demonstrated by Goetsch, Cushing, and Jacobson, according to an editorial (Med. Rec., Nov. 13, 1915). The last 2 observers, in conjunction with Weed, have shown that electrical stimulation of the pituitary gland causes glycosuria, even when this organ is severed from all nervous connection with the abdominal organs. Sajous had previously pointed (1907) to 2 forms of diabetes, the sthenic and asthenic, in which the pituitary, adrenals and thyroid, constituting what he termed the adrenal system, and the pancreas, were factors in the genesis of the disease.

Lindblom (Hygiea, vol. lxxviii, No. 11, 1916) observed a case of severe diabetes mellitus with atrophy of the thyroid and pituitary, also lipemia, in a boy of 16 years. The clinical features of the case and the necropsy showed that the internal secretion of the pancreas was first at fault, possibly as the result of severe osteomyelitis over 3 years before. The unusually severe diabetes was fatal the sixteenth month. His urine contained from 600 to 800 Gm. sugar a day. He urges that owing to the reduced functioning of the pancreas, the thyroid and hypophysis were spurred to excessive activity, which finally entailed atrophy of the 2 latter organs, with resulting functional insufficiency of both. The symptoms from this were benefited.

In a study of the pituitary gland in diabetes mellitus H. J. B. Fry (Quart. Jour. Med., July, 1915) found definite histological changes in the anterior lobe of 8 cases, *i.e.,* adenomatous masses of eosinophilic cells, colloid invasion of the anterior lobe, besides areas of cellular degeneration. Disease of the pancreas was also present.

Treatment, iv. 48.—On the basis of experiments in animals by F. M. Allen (Boston Med. and Surg. Jour., Feb. 18, 1915) which showed that *persistent* diabetes occurred in animals from which nearly all the pancreas, over 9/10, had been removed; and also that in an animal deprived of less pancreatic tissue—1/6 perhaps—a diabetes occurred which could be stopped by a carbohydrate-free diet, or checked early by starvation, concluded that diabetes was not a disease *per se,* but merely the result of deficient pancreatic activity, with a resulting deficient assimilation of certain foods. If, therapeutically, a glycosuria in a partially depancreatized animal is arrested by fasting, and the animal is then placed on a diet that will support life without causing glycosuria, we have the basic principle of **Allen's method.** The animal may be, and remain, thin under this treatment, but he is strong and lively.

The method is, in brief, as follows: The patient, even though emaciated and showing sugar and acidosis, is put to bed and receives no food whatever, until glycosuria disappears, and then 24 to 48 hours longer. Plain fasting suffices, but alcohol being a food which does not cause glycosuria, from 50 to 250 c.c. (12½ drams to 8 ounces) of whisky or brandy, subdivided into 10- to 20- c.c. (2½ to 5 drams) doses, should be given in 24 hours. The acidosis then falls rapidly. If coma threatens, large amounts of water and sodium bicarbonate are used and continued a few days.

When the fasting patient shows no sugar during 24 or 48 hours, feeding should be begun, but very slowly and cautiously. The one requirement is that the patient remain free from both glycosuria and acidosis. Any trace of sugar is the signal for a fast day, with or without alcohol. The articles to be considered in the diet are carbohydrates, protein, fat, and bulk. Frequently the first thing given after the fast is carbohydrate, 200 Gm. (6⅔ ounces) of vegetables of the 5 and 6 per cent. classes gradually increased day by day until a trace of glycosuria appears, which is checked by a fast day; thus we learn the carbohydrate tolerance and clear up the last trace of acidosis. After this protein is given, an egg or 2 the first day and nothing else. More protein, eggs or meat, is added day by day until the patient shows glycosuria or reaches a safe protein ration. The purpose is to learn the protein tolerance, and to cover protein loss as quickly as possible. Fat is somewhat less urgently needed, except in very weak and emaciated patients, and can be added gradually. An element of bulk is necessary to give the comfortable feeling of fullness and to prevent constipation. This is the great advantage of green vegetables, which may be fed raw or cooked. When even these cannot be tolerated they may be boiled through 3 waters, throwing away all the water, thus removing nearly all the starch, and the patients generally take these thrice cooked vegetables gladly, without glycosuria. One result of this program is a loss of weight, but this seems to be beneficial. In subsequent treatment, the patient is welcome to gain weight up to a certain point if he can do so without glycosuria or acidosis.

J. H. Kellogg (N. Y. Med. Jour., Mar. 25, 1916) recalls the fact that Guelpa, of Paris, in a paper entitled "Starvation and Purgation in the Relief of Disease," read before the British Medical Association in London, July, 1910, advocated **starvation** as a method of rendering diabetics sugar-free and of lessening their acidosis. The author holds that to Guelpa belongs the credit for the discovery, that a diabetic can abstain from food for several days without danger of increasing acidosis or bringing on coma, and that during fasting the sugar output very rapidly decreases as does also the acidosis. Within the last two years Kellogg and his colleagues have treated 267 diabetics by Guelpa's methods, with very gratifying results.

J. Friedenwald and L. Limbaugh (Interstate Med. Jour., Jan., 1916) report 20 cases treated by the **Allen starvation plan,** all of which were rendered sugar-free in 1 to 4 days.

H. S. Stark (Med. Rec., June 3, 1916) states that after the fifth year of diabetes, nephritis occurs in 35 to 40 per cent. of the patients. **Allen's starvation method** in the writer's hands showed sugar-free urine in 4 to 7 days in 7 of 12 cases, while the other 5 resisted the treatment. The renal and cardiac functions require constant watching. The blood-pressure curve is a guide to treatment, for when a diabetic is drowsy or has headaches, with increasing blood-pressure, accentuated second aortic sound, and increasing albuminuria, the nephritis needs more attention than the glycosuria.

A. Stengel, L. Jonas and J. H. Austin (Penna. Med. Jour., Jan., 1916) put the patient to bed and oblige him to fast, except that he is permitted to take **alcohol,** water, and **sodium bicarbonate.** Alcohol is given in the form of whisky in hourly doses, from 50 to 250 c.c. (12½ drams to 8 ounces) daily. The fast is continued from 24 to 48 hours after sugar has disappeared. Green vegetables are then increased until sugar again appears in the urine. Then there is another day of fasting. The patient is kept about 10 pounds below his former weight. It is the most effective treatment for cases exhibiting high ketonuria.

Prophylaxis.—E. P. Joslin (Boston Med. and Surg. Jour., Apr. 13, 1916) states that acid poisoning had been responsible for the deaths of 66 per cent. of all his cases. In children, which have constituted about 7 or 8 per cent. of the latter, 100 per cent. of deaths were due to it. If the signs of acid poisoning could be prevented from making their appearance then the patients could be prevented from dying of coma. The **Allen treatment** enabled him to carry this into practice. Where there was any doubt about the advisability of using the starvation treatment he cut the fats from the diet, as most of the acids are made from fats. Then in succeeding days the carbohydrates were gradually cut down. The majority of the patients became sugar-free before the fasting was necessary. A number of children who might have died in the hospital were thus rendered acid- and sugar- free within comparatively short periods.

C. D. Christie (Jour. Amer. Med. Assoc., Jan. 20, 1917) had a case with no capacity to use any sugar, even that derived from the body protein, with intense and increasing acidosis, and a febrile complication in the form of an infected carbuncle. The **fasting treatment,** continued 11 days, restored the utilization of sugar and caused a marked reduction in acidosis. During the period of fasting he received only 180 mils of whisky daily and large doses of **sodium bicarbonate.** The only trustworthy method of measuring the aci-

dosis was found to be determination of the alveolar carbon dioxide tension.

acetanilide in, i. 227
acetphenetidin in, i. 252
alcohol in, i. 531
alkalies in, iv. 61
alkaline drinking waters in, iv. 59
antipyrin in, ii. 45; iv. 59
arsenic in, ii. 140; iv. 59, 60
atropine methylbromide in, iv. 60
atropine sulphate in, iv. 60
belladonna in, iv. 60
Bier's hyperemia in, v. 594
bromides in, iv. 59, 60
cannabis indica in, iii. 9
cascara in, iv. 60
castor oil in, iv. 59
chloral hydrate in, iii. 211
climate in, iv. 61
codeine in, iv. 59, 60

When diet does not suffice according to L. N. Boston (N. Y. Med. Jour., Apr. 25, 1914), results are sometimes obtained by the liberal use of codeine sulphate. Extract of oxgall and pancreatic extract often prove most effectual. When using oxgall and pancreatin it is well to direct that they be placed in *pills coated with keratin and a second coating of salol.*

codliver oil in, iv. 58
creosote in, iii. 688
diet in, iv. 48, 69
electricity in, iv. 62
ergot in, iv. 572
Fowler's solution in, iv. 59, 60
gluten in, iv. 53
glycerin as sweetening in, v. 29
hediosit in, iv. 58
hepatic opotherapy in, iv. 61
hexamethylenamine in, iv. 60
inulin in, iv. 58
jambul in, iv. 61; vi. 92
lactic acid bacilli in, iv. 57

Lactic acid bacillus cultures calculated to antagonize intestinal putrefaction have been tried with some degree of success by Horowitz (Med. Rec., Jan. 25, 1913), Boston (N. Y. Med. Jour., April 25, 1914), and others, but A. C. Henderson (Jour. Amer. Med. Assoc., Feb. 16, 1915) and other observers failed to obtain improvement.

Diabetes mellitus (*continued*).
  lactose in, iv. 58
  levulose in, iv. 58
  lime waters in, vi. 712
  lithium in, vi. 367
  liver extract in, i. 796
  manganese in, iv. 61
  methylene blue in, vi. 686
  morphine in, vii. 189
  oatmeal in, iv. 51
  olive oil in, iv. 58, 59
  opium in, iv. 59, 60; vii. 189
  ozone in, iv. 61
  pancreatic opotherapy in, iv. 61
  pancreatin in, vii. 299
  phenol in, iv. 60
  physical exercise in, iv. 61
  piperazin in, vii. 477
  quinine in, iii. 388; iv. 59
  saccharin in, iv. 58; viii. 45
  sesame oil in, iv. 58
  sodium bicarbonate in, iv. 28, 49, 69; viii. 192
  sodium cacodylate in, ii. 701, 704
  sodium carbonate in, viii. 192
  sodium salicylate in, v. 59; viii. 57
  soya bean in, iv. 53
  strontium bromide in, viii. 408
    salicylate in, viii. 408
  sulphonal in, viii. 426
  tests in, iv. 40
    Benedict test in, iv. 44
    Ronchese test in, iv. 30
    Seegen test in, iv. 42
    Williamson test in, iv. 19
  Turkish bath in, viii. 812
  valerian in, iv. 60
  X-rays in, iv. 62
acetonemia of, iv. 24
  alcohol in, iv. 63
  alkalies in, iv. 63
  diet in, iv. 62
  oatmeal in, iv. 63
  sodium bicarbonate in, iv. 64
  sodium citrate in, iv. 65
acidosis of, iv. 24

L. G. Rowntree (Trans. Assoc. Amer. Phys.; Med. Rec., Aug. 5, 1916) mentions a case in which enough alkalies were given to render the blood alkaline; but in spite of this the acetone bodies in the blood persisted in twice the normal amount, the patient dying in typical coma.

Epstein and Felsen (Amer. Jour. Med. Sci., Jan., 1917) found that the withdrawal of food in certain cases provoked or aggravated the acidosis. The latter causes an increase in the blood sugar content, in one of two ways: (*a*) by augmenting the mobilization of sugar, and (*b*) by affecting the sugar secreting function of the kidneys. Liberal, but judicious, administration of carbohydrate may control the acidosis caused by the withdrawal of carbohydrates or complete fasting. A rise in blood-sugar content, associated with a gradual fall in the alveolar carbon dioxide is indicative of impending coma.

carbuncles and furuncles of, iv. 37
- **antiseptics** in, iv. 68
- **calcium creosote** in, iv. 68
- **excision** in, iv. 68
- **free drainage** in, iv. 68
- **mercury (yellow oxide)** in, iv. 68
- **passive congestion** in, iv. 68
- **sodium perborate** in, iv. 68
- **staphylococcus vaccine** in, ii. 366
- **sulphur** in, iv. 68
- **tonics** in, iv. 68
- **vaccine** in, iv. 68

coma of, iv. 27

Riesman (Jour. Amer. Med. Assoc., Jan. 8, 1916) observed a case of diabetic coma in which marked reduction of intraocular tension caused *softness of the eyeball* under pressure. Heine holds that a soft eyeball in a patient in coma proves the coma to be diabetic.

Dehydration is common in diabetic coma, though not the cause of the coma, according to LeConte and Dorie (Presse méd., Apr. 2, 1917), appearing only after the latter is under way. It shows most in the eyeball. In 2 typical cases the specific gravity of the blood was 1064 and 1068, while the reds in 1 case were 8,340,000, while in the other patient copious drinking of water caused the reds to drop nearly to half their original figure. The pressure in the arteries may be so low as to amount to actual heart failure, with suppression of urine secretion. The dehydration is evidently most pronounced in the parenchyma of the kidneys and pancreas. They warn that in diabetic coma hypertonic solutions of sodium bicarbonate should be avoided, since they would dehydrate the blood still more, and possibly tend to clump the corpuscles.

- **intravenous infusion** in, viii. 804
- **saline hypodermoclysis** in, viii. 804
- **sodium bicarbonate** in, viii. 192
- **venesection** in, viii. 804

dryness of the mouth, **pilocarpine** in, vii. 471

gangrene of, iv. 37, 795, 802
- **amputation** in, iv. 65, 67, 799, 802
- **antiseptic dressings** in, iv. 65
- **aristol** in, iv. 800
- **autogenous vaccine** in, iv. 67
- **Bier's hyperemia** in, iv. 67
- **chloroform** in, iv. 66
- **codeine** in, iv. 67
- **glycerin** in, v. 31
- **hot, dry air** in, iv. 66, 799, 800

Dupeyrac (Presse méd., July 11, 1914) emphasizes the efficiency of **hot air** at a temperature of about 700° C., followed by preparation of suitable flaps when the danger of septic infection has been overcome. In a case with the 3 last toes gangrenous, the foot edematous, and the entire leg infiltrated, hot air treatment proved so effectual that only the last 2 toes had to be amputated. The measure should not be applied, however, until after demarcation of the dead parts has occurred.

- **iodoform** in, iv. 800
- **massage**, 800
- **morphine** in, iv. 67
- **nitroglycerin** in, iv. 67
- **nitrous oxide** in, iv. 67
- **nitrous-oxide-oxygen anesthesia** in, iv. 67
- **orthoform** in, iv. 800
- **oxygen inhalations** in, iv. 66
- **potassium iodide** in, iv. 67
- **resorcin** in, iv. 800
- **sodium bicarbonate** in, iv. 67
- **sodium iodide** in, iv. 67

hyperglycemia in.

A. A. Epstein (Med. Rec., Jan. 30, 1915) found that the blood-volume in both normal and diabetic individuals was subject to considerable variations as a result of ingestion of food and fluids. Serial study of the blood-sugar showed the percentage of sugar in the blood might go up or down correspondingly.

Hirschfeld (Deut. med. Woch., July 2, 1914) refers to 2 diabetic men of 69 and 72 who showed an unusually high sugar content in the blood, which declined under restriction of albumin and increased intake of carbohydrates. He attributes this to the more sluggish action of the kidneys in the elderly. Their kidneys are unable to throw off readily fluids and salts, and this should be taken into account in the diet. They should not be allowed more than 70 Gm. albumin.

The most satisfactory *test for* the determination of *sugar content of blood* is Bang's. It requires but 2 or 3 drops of blood. They are taken from the lobe of the ear on a piece of blotting paper 16 by 28 mm. The scrap of paper is held with forceps, and it is not allowed to soak up too much blood. It is then placed in a test-tube. A second test-tube holding 5 c.c. of a mixture of 136 c.c. of saturated solution of potassium chloride, 64 c.c. water, and 0.15 c.c. of a 25 per cent. solution of hydrochloric acid, is heated, and when it boils it is poured carefully over the blood-paper. In order to have the fluid come in contact with all the blood he holds the tube slanting. When entirely cool, not until after ½ hour, the fluid is then poured into a third test-tube, and to it are added 5 drops of the Fehling II reagent and 2 drops of Fehling I. It is then boiled for ½ minute and watched for 2 minutes. If no oxide precipitates out in 2 minutes, the proportion of sugar in the blood is below 0.15, that is, it is within practically normal range. The amount of oxide thrown down is an index of the sugar in the blood.

neuritis of, vi. 797
polyneuritis of, **Bier's hyperemia** in, v. 595
Diabetes mellitus (*continued*).
  pruritus of, **atropine** in, ii. 452
    salophen in, viii. 70
  retinitis of, vii. 200
Diacetic acid, i. 241
Diaphragm, spasm of, **pilocarpine** in, vii. 470
Diaphragmatic hernia, v. 492
Diaphtol, vii. 446
Diarrhea, **alcohol** in, i. 531. See also Enteritis, this Index.

The prevention of diarrhea by preventing chilling of the abdomen is advised by Schmidt (Med. Klinik, Feb. 21, 1915), who remarks that intestinal trouble is far less prevalent among the German troops in this war than in any previous campaign. He urges the necessity for wearing a warm **woolen band around the abdomen** when there is a tendency to diarrhea. Such persons are generally dyspeptic, with insufficient gastric secretion or excessive motor functioning in stomach and bowel.

Henius (Deut. med. Woch., July 23, 1914) adopts Fuld's explanation that gastrogenous diarrhea really means a diarrhea set up by reflex action on the colon from the oversensitiveness of the stomach. The aim should be to counteract the gastric irritability.

aluminum carbonate in, i. 590

Cloetta (Correspondenzbl. f. schweizer Aerzte, July 22, 1916) suggests the administration of a **colloidal hydroxide of aluminum** to take the place of bismuth, which has risen much in price. It passes through the stomach, becoming dissolved gradually in the intestine, where it is not absorbed, but exerts an astringent action. E. Liebmann (*Ibid*) reports several cases in which this remedy, described under the name **alutan,** produced excellent results. It is useful in various forms of diarrhea. The dose is from 2 to 3 tablespoonfuls daily, given in water or milk. It sometimes causes nausea and vomiting.

betanaphthol in, ii. 465
bismuth subnitrate in, viii. 58
blood-pressure in, ii. 498
calumba in, ii. 722

Diarrhea (*continued*).

- camphor in, ii. 731
- cloves in, iii. 461
- emetine in, iv. 447
- erigeron in, iv. 573
- gallic acid in, iv. 793
- gambir in, iv. 793
- ginger in, viii. 837
- hamamelis in, v. 161
- hematoxylin extract in, v. 394

  Eisner (Therap. d. Gegenwart, Mar., 1915) states that **bolus alba (kaolin)** has been proved most efficient for diarrhea in the present war. It apparently acts by absorbing the toxins and mechanically engulfing the bacteria. Blood-charcoal acts very similarly, and the 2 can be used in combination.

  W. F. Petersen (Jour. Amer. Med. Assoc., Apr. 28, 1917) referring to **Fuller's earth** and **kaolin**, points out that the former is more effective as an absorbent than kaolin, because it carries a positive electrical charge which gives it an affinity for negatively charged colloids, lipoids, etc.

- koumiss and kefir in, vi. 237
- lactic acid in, vi. 242
- lead acetate in, vi. 313
- menthol in, vi. 649
- mercury bichloride in, vi. 680
- morphine in, vii. 188
- opium in, vi. 313; vii. 188
- pantopon in, vii. 177
- resorcin in, vii. 808
- salol in, viii. 58
- sulphuric acid in, viii. 432
- sumbul in, viii. 433
- thiocol in, viii. 528
- uva ursi in, viii. 763
- zinc phenolsulphonate in, viii. 836
- acid, charcoal in, iii. 122
  - potassium bicarbonate in, vii. 577
- alba, see Diarrhea, Chylous, v. 715
- choleraic, see Cholera Asiatica, v. 719; also this Index.
  - buttermilk in, iv. 105
  - copaiba in, iii. 641
  - copper sulphate in, iii. 645
  - diet in, iv. 105
  - gelatin injections in, iv. 105
  - hydrastis in, iv. 105
  - iron in, iv. 105

Diarrhea, choleraic (*continued*).

  - silver nitrate in, iv. 105
  - starch-water injections in, iv. 105
  - zinc salts in, iv. 105
- chronic, aromatic sulphuric acid in, vi. 237
  - climatic treatment in, vi. 716
  - hematoxylon extract in, vi. 237
  - ipecac in, viii. 836
  - iron waters in, vi. 712
  - krameria in, vi. 237
  - opium in, viii. 836; vi. 237
  - pancreatin in, vii. 298
  - zinc oxide in, viii. 836
  - zinc sulphate in, viii. 836
- chylous, v. 715
- colliquative, atropine in exhaustion of, ii. 450
  - bismuth salts in, viii. 634
  - nitric acid in, vii. 45
  - turpentine in, viii. 634
- convalescence from, iron in, vi. 86
- due to diminished secretion, podophyllum in, vii. 567
- epidemic, sulphuric acid in, viii. 432
- fermentative, naphthalene in, vi. 785
  - phenol in, vii. 442
- fetid, zinc phenolsulphonate in, vii. 447
- from indigestion, magnesium oxide in, vi. 473
  - quassia in, vii. 721
  - rhubarb in, vi. 473
- functional, iv. 79
  - acacia in, iv. 82
  - albumin milk in, iv. 83
  - albumin water in, iv. 81, 82
  - alcohol in, iv. 82
  - barley water in, iv. 81
  - bismuth in, iv. 81, 82
  - brandy in, iv. 81
  - buttermilk in, iv. 83
  - calomel in, iv. 80, 81
  - castor oil in iv. 81, 82
  - cinnamon in, iv. 82
  - diet in, iv. 80, 81, 82
  - fresh air in, iv. 82, 83
  - gelatin in, iv. 83
  - rhubarb (aromatic tincture) in, iv. 82
  - rice water in, iv. 81
  - saline solution in, iv. 82
  - sponge baths in, iv. 82
  - sugar of milk in, iv. 82
  - tannic acid in, iv. 82
  - whisky in, iv. 81
- hill, v. 718
  - absolute milk diet in, v. 718

Diarrhea, hill (*continued*).
  change of location in, v. 718
  predigested milk in, v. 718
 infantile, iv. 69. See also Gastrointestinal Catarrh of Infants, iv. 83; also this Index.

Morse (Amer. Jour. Med. Sci., Jan., 1915) divides the micro-organisms which are the primary cause of diarrhea in bottle-fed infants into 3 main classes: the dysentery bacillus in all its forms, the gas bacillus and similar organisms, and thirdly, other bacteria, chiefly streptococci, the colon bacillus, and the pyocyaneus. The symptoms afford no clue as to the form of organism present, and nothing about the stools aids except, rarely, the peculiar green color caused by the bacillus pyocyaneus and the streptococcus. In the former instance the green color will disappear on the addition of nitric acid, and in the latter the streptococcus can usually be easily recognized by the microscope. The only affection with which a typical case may be confounded is intussusception.

Treatment should begin with a dose of **castor oil**, stopping all food from 12 to 24 hours, giving water freely.

In diarrhea due to the *dysentery* and *colon bacillus* and *streptococcus,* carbohydrate food is indicated. **Sugar** and **lactose** are better than starch, dextrin and maltose preparations. The **milk** should be given in **barley water.** Some protein food, **whey, casein** should be added gradually as soon as there is improvement. No fat should be given until actual convalescence.

In diarrhea due to *gas bacillus,* carbohydrates should be cut down and **acid producing bacteria** introduced into the bowels; **buttermilk** or, better, mixtures containing 3 or 4 per cent. of **lactose** and from 1.5 to 2.5 per cent. of **protein ripened with lactic acid organisms.** At any given time most cases of infectious diarrhea are due to the same organism.

An unscientific, but often the only practicable method, is to give what seems to be the most **rational diet** and then observe the results. **Irrigation of the bowels** once or twice a day is useful, and if blood and pus persist in the stools after evidences of toxemia have disappeared, injections of **silver nitrate** may be of service. The various so-called intestinal antiseptics are of little or no value, and there is no serum. **Hot stupes** or **compresses** allay pain and tenesmus, though sometimes **opium** (preferably small repeated doses of **paregoric** or **Dover's powder**) is required. Stimulants such as **strychnine, caffeine,** and **camphor** are often called for.

L. W. Hill (Boston Med. and Surg. Jour., Apr. 6, 1916) divides the diarrheas of infancy into 3 classes: infectious, nervous, and fermentative. The fermentative diarrhea is caused by an excessive decomposition of carbohydrates or protein. The carbohydrate type is the commoner, and includes nearly all cases of diarrhea with strongly acid stools. The three principal causes are too high a sugar percentage in the food, too much food at a time, and bad milk. The important principle is to give a **food low in carbohydrate.** If this food can contain a considerable amount of protein, in an easily digestible form, a great deal will have been gained, for the reaction of the intestinal contents can be changed from acid to alkaline by the alkaline end products of protein disintegration. The writer recommends for babies under 6 months old a mixture of **skim milk** and water with enough **calcium casein** to bring the protein proportion up to 2.60 per cent.—giving the formula: Fat, 0.25; sugar, 2.25; protein, 2.60. For babies over 6 months old the same dilution of casein is added to 3 per cent. One-third of an ounce of powdered casein in a mixture of 16 ounces of skim milk and water is used, but the powdered milk and 16 ounces of water raises the protein proportion to 2.60 per cent. In a 48-ounce mixture, half skim milk and half water, ⅔ of an ounce of powdered casein raises the protein to 3 per cent. In general slightly smaller amounts are given than to a well baby. After a day or two the stools diminish in number, become more yellow, and after three to five days become pasty, light yellowish brown in color, and alkaline in reaction. After the diarrhea has stopped, whole milk is added to make the fat proportion from 1 to 2 per cent., and if this is borne well, in two or three days enough sugar is added to make the sugar proportion about 3.5 per cent. **Malt sugar** is the best to use.

F. B. Talbot (Jour. Amer. Med. Assoc., June 26, 1915) found that the respiratory quotient was very low on the second or third day of life, as low as that observed in acidosis or diabetes. He had not, however, found acetone bodies in the urine.

J. Howland (*ibid.*) held that since these children come in with the intestines empty, it is dangerous to let them have eight or ten large stools a day. He gives a small dose of **opium** after each loose stool. He usually gives 4 Gm. (60 grains) of alkali at a time, subcutaneously, 5 or 6 Gm. (75 to 90 grains) intravenously, and 3 or 4 Gm. (45 to 60 grains) by mouth. **Protein milk,** rather concentrated, and in small amount, is the best food.

J. Howland and W. McK. Marriott (Jour. Amer. Med. Assoc., June 26, 1915) tested the alveolar air in infants suffering from severe diarrhea and found the CO_2 tension lowered, especially if dyspnea is present. This low tension is an evidence of acidosis. Giving **alkalies** in large quantities causes the carbon dioxide tension to rise and the dyspnea to disappear. Cathartics should not be given unless there is distension of the abdomen with fever.

H. D. Chapin (Med. Rec., June 24, 1916) has shown by X-ray pictures that the sigmoid flexure of infants is a very much larger and more complicated structure than is believed. In several it reached above the umbilicus; in others it formed a figure of 8, and was very mobile and very large. High enemas are useless in babies. If a soft catheter is passed 2 or 3 inches, and the bag is placed about 2 feet above the baby's body, one can wash out the whole large intestine, if the solution flows in slowly.

Chronic Mechanical Disorders.—C. G. Kerley (Med. Rec., June 24, 1916) referred to the fact that certain cases showing recurrent symptoms of gastrointestinal disturbance, vomiting, fever, etc., do not respond to treatment usually effective in such cases. The X-ray has furnished the explanation. In some an elongated sigmoid was found, and in others a ptosis of the stomach; others again showed a partial pyloric stenosis. The bowels are cleared with **Russian oil, olive oil,** or **fluidextract of cascara.** A teaspoonful of the latter in 3 doses gives better results than when given at once. **Massage** and **physical therapy** was of the greatest aid in constipation due to the long sigmoid. He omitted white bread, crackers, and similar articles, and gave more green vegetables and fruits, except in cases in which there was diarrhea. In cases with diarrhea he omitted the fruit and vegetables and gave boiled skimmed milk.

  asafetida in, vi. 473
  betanaphthol benzoate in, vi. 786
  bismuth in, ii. 473
  borax in, ii. 588
  calcium creosote in, iii. 687
  calomel in, vi. 767
  camphor (monobromated) in, ii. 732
  chalk mixture in, ii. 720
  gray powder in, vi. 671
  jambul in, vi. 92
  lead acetate in, vi. 313
  lime water in, ii. 720
  magnesium carbonate in, vi. 473
  magnesium oxide in, vi. 473
  opium tincture in, vi. 473
  sodium sulphate in, viii. 186
  thymol in, viii. 533
inflammatory, see Gastrointestinal Catarrh, Acute, iv. 83, and Ileocolitis, Acute, iv. 99; also this Index.
lienteric, **hydrochloric acid** in, v. 556
  pancreatin in, vii. 299
mild, **hop tea** in, vi. 467
nervous, **pancreatin** in, vi. 299
of children, **aromatic syrup of rhubarb** in, viii. 30

Diarrhea of children (*continued*).
    castor oil in, iii. 16
    creosote in, iii. 687
    eudoxin in, iv. 706
    protargol in, viii. 136
    chronic, zinc oxide in, viii. 836
  of nurslings.

Marfan (Paris méd., Feb. 3, 1917) recommends that in slight diarrhea in breast-fed babies, on the first day, the child be put to the breast only every 4 hours for 5 or 6 minutes at a time; a few teaspoonfuls of pure boiled water may be given in the intervals. On the next day, the intervals may be somewhat shortened, the third day, the duration of the feedings increased, and thereafter a gradual return to normal feeding allowed. In more intense diarrhea, 3 or 4 feedings may be omitted, the milk being replaced by a quantity of boiled water by bottle or spoon equal to the amount of milk the child would have taken if well. Feeding as in mild diarrhea is then carried out.

  serous, cajuput oil in, ii. 709
    ergot in, iv. 572
    kino in, vi. 235
    pomegranate in, vii. 331
    sulphuric acid in, viii. 432
  summer, acetic acid in, i. 231
    ammonia in, i. 611
    bismuth subnitrate in, viii. 836
    camphor in, ii. 731
    corrosive sublimate in, vi. 679
    naphthalene in, vi. 785
    nitric acid in, vii. 45
    nux vomica in, vii. 146
    pepsin, saccharated, in, viii. 836
    zinc oxide in, viii. 836
  tropical, camphor in, ii. 731
    creosote in, iii. 688
    kola in, vi. 235
  tuberculous, bismuth subnitrate in, vi. 474
    calcium carbonate in, vi. 474
    Dover's powder in, vii. 190
    lead acetate in, vi. 313
    magnesium hydroxide in, vi. 474
    magnesium sulphate in, vi. 474
    sodium bicarbonate in, vi. 474
  tubular, see Colitis, Mucous, v. 699; also this Index.
Diaspirin, viii. 47
Diathermy, iv. 427

A. E. Scherbak (Roussky Vratch, Jan. 2, 1916) obtained good results from the application of diathermy to the cervical vertebræ in cases of circulatory disturbances of the brain, organic as well as functional. The method of application consisted in the use of 2 electrodes with a combined area of 57.5 square cm. The upper electrode was applied to the upper cervical vertebra, and the lower to the middle dorsal. From 0.5 to 0.7 ampère was employed, each treatment lasting 5 to 6 minutes.

Diazo-reaction, in various diseases, iv. 106
Dieffenbach's wellenschnitt for harelip, viii. 437
Dieffenbach-Jæsche method for formation of lower lip after complete excision, viii. 438
Dietetics; indicated in each disease.
Diethyl barbituric acid, see Veronal, viii. 807
Diethylenediamine, see Piperazin, vii. 476
Diethylmalonylurea, see Veronal, viii. 807
Diethylsulphonedimethylmethane, see Sulphonal, viii. 421
Dietl crisis, the, v. 772
Dieudonné's culture medium, v. 724
Differential blood-count, v. 376, 380
Diffuse aneurism, i. 665
Digalen, iv. 114

H. Beates, Jr. (Amer. Jour. Clin. Med., vol. ii, p. 1025, 1915), points out that all myocardial degenerative processes resulting in loss of circulatory equilibrium and culminating in cardiac failure can, in their incipiency, be postponed if digalen is given and its administration continued as indications require. Later they may be controlled and the circulatory equilibrium maintained for many years longer with this agent than under other methods.

Digipuratum, iv. 114
Digitalein, iv. 111
Digitalin, iv. 111, 112, 114
Digitaline, iv. 114
Digitalis, iv. 109
  physiological action, iv. 121

Danielopolu, of Bucharest (Presse méd., June 5, 1916), states that prolonged observations in 32 cases has convinced him that digitalis never raised, but often lowered, the blood-pressure. Its hypotensor action seems to be more marked if a suitable dose of physostigmine has previously been administered. Clinically, Cary Eggleston (N. Y. Med. Jour., June 16, 1917) showed that digitalis did not tend to increase the systolic blood-pressure in man, except to a very slight extent and in a small minority of the cases.

In a comparative study of various drugs of the digitalis group, Halsey (So. Med. Jour., Aug., 1916) states that they only differ from each other mainly in the rate and certainty with which they are absorbed and excreted, and in their local action before absorption. Ordinary digitalis is absorbed more rapidly and certainly and is less irritant to the stomach than any of its congeners. Many textbooks state that strophanthus is preferable to digitalis where prompt action is desirable or where the digestion is disturbed. Real facts are directly opposed to this.

The official tincture of digitalis is absorbed more rapidly from the gastro-intestinal tract of cats than is the infusion, state Haskell, McCants and Gardner (Arch. of Internal Med., Aug., 1916). Digipuratum, digalen, and digipoten, seem to possess no decided advantage over the official tincture. Digalen is absorbed more rapidly, but the variability in strength, and the low standard of strength, together with its high cost, more than offset this advantage.

Cohn, Fraser and Jamieson (Jour. of Exper. Med., June, 1915) state that the influence of digitalis on the T-wave of the human electrocardiogram may be detected in 36 to 48 hours after the use of digitalis was begun; it may persist as long as 22 days after its use has been stopped, though it may persist only 5.

P. D. White (Boston Med. and Surg. Jour., Aug. 17, 1916) calls attention to an unusual removal by digitalis of all evidence of auricular activity from the electrocardiogram and from the jugular pulse tracings.

poisoning, iv. 130
  alcoholic preparations in, iv. 136
  artificial respiration in, iv. 136
  atropine in, iv. 136
  caffeine in, iv. 136

W. M. Barton (Amer. Jour. Med. Sci., Sept., 1915) states that although digitalis arrhythmia will disappear spontaneously in many cases when the drug is stopped, there are others in which the conductive system is so depressed that serious results may arise. Caffeine is then of service.

  castor oil in, iv. 132
  emetics in, iv. 136
  hot coffee in, iv. 136
  lavage of stomach in, iv. 136
  Lugol's solution in, iv. 136
  magnesium sulphate in, iv. 136
  moist, hot applications to lumbar region in, iv. 136
  nitroglycerin in, iv. 136
  opium in, iv. 132
  strychnine in, iv. 136
  tannic acid in, iv. 136
Digitalysatum, iv. 115
Digitol, iv. 114
Digitonin, iv. 111
Digitophyllin, iv. 111
Digitoxin, iv. 111, 112
Di-iodobetanaphthol, vi. 786
Dilatation of cervix, cocaine in, iii. 488
  of esophagus, see Esophagus, Dilatation of, iv. 622; also this Index.
  of the heart, see Heart, Dilatation of, v. 258; also this Index.
  of the stomach, see Stomach, Dilatation of, viii. 344; also this Index.
Dillon's antiseptic dentifrice, vii. 582
Diluting fluids for examination of blood, v. 373
Dimethylamino-antipyrin, see Pyramidon, vii. 717
Dimethylarsenic acid, see Cacodylic Acid, ii. 699
Dingee, see Dengue, iii. 783; also this Index.
Dioctophyme gigas, see Eustrongylus Gigas, vii. 319
Dionin, vii. 172, 176, 182
Dioxydiamidoarsenobenzol (salvarsan), iv. 159

Clinical tests of a new salvarsan preparation given them by Ehrlich for trial were reported by Wechselmann and Dreyfus (Münch. med. Woch., Feb. 9, 1915). This preparation, sodium-salvarsan (salvarsan-natrium) chemically is practically the same in fixed form as is obtained by adding alkali in the preparation of salvarsan solution for intravenous use. The compound has the same clinical action as the original salvarsan while it is as readily soluble as neosalvarsan. It contains about 20 per cent. of arsenic, and is a yellow powder, which darkens on exposure to air, and becomes insoluble and very toxic. Its solutions are alkaline. Wechselmann gives it in doses of from 0.3 to 0.6 Gm. (5 to 10 grains), 2 or 3 times a week, using 10 c.c. (2½ drams) of a 0.4 per cent. salt solution for every 0.1 Gm. (1½ grains) of the drug. Dreyfus, on the other hand, gives it in concentrated solution in distilled water with a glass syringe, the total amount of fluid being about 30 c.c. (1 ounce).

Administration, iv. 180

Intracranial Injection Of.—Of 14 cases of *paresis* treated by Wardner (Amer. Jour. of Insanity, Apr., 1916) by intracranial injection of salvarsanized serum, 5 improved enough to return to work, and were still well after 7 to 11 months. At the end of 11 months, 1 patient had a bad relapse, but he responded immediately to additional treatment. At the time of writing he was well, mentally and physically. Three other well-developed patients improved sufficiently to be put on parole of the grounds of the asylum and do efficient work. Three more showed fairly marked physical and mental improvement, and 2 died. Two cases showed no improvement. Maximum improvement occurred, as a rule, after 6 or 7 treatments.

Intramuscular Injection Of.—Harrison, White and Mills (Brit. Med. Jour., May 5, 1917) treated 2 parallel series of cases of syphilis, the 1 with intravenous injections of salvarsan or its substitutes, the other with deep subcutaneous or intramuscular injections of neosalvarsan or its substitutes, and found the subcutaneous or intramuscular method distinctly more efficient than the intravenous in both primary and secondary stage cases, though slightly better results seemed to follow the intravenous method in tertiary cases. Hypodermic administration was decidedly more effective than intravenous in producing a negative Wassermann reaction. The drug being more slowly absorbed and eliminated, the tissues are kept effectively saturated. The alarming side actions are almost wholly absent. To obviate pain neosalvarsan is best given subcutaneously or intramuscularly in a solution of 0.6 Gm. (10 grains) in 1 c.c. (16 minims) of 4 per cent. stovaine, to which 1 c.c. (16 minims) of creocamph cream is added and the whole well shaken. The solution is prepared in the syringe.

J. E. R. McDonagh (N. Y. Med. Jour., May 3, 1913) warns against incising the *toxic edema* sometimes resulting *from intramuscular salvarsan injections.* Incision is indicated if an obvious abscess forms, when acute pain is noted. Alternate hot and cold applications give much relief. The redness which appears with the swelling quickly disappears under the following lotion:—

℞ *Plumbi subacetatis.* gr. x (0.6 Gm.).
Aquæ ammoniæ fortioris .... ♏v (0.3 c.c.).
Alcoholis .... ʒj (4 c.c.).
Liquoris alumini acetatis (N. F.). ʒiij (12 c.c.).
Aquæ ......q. s. ad ℥j (30 c.c.).
M. ft. lotio.

Intraspinal Injection Of.—For treating the late manifestations of central nervous syphilis, direct application of the remedy to the nervous tissue has seemed desirable to U. J. Wile (Jour. Amer. Med. Assoc., Apr. 11, 1914). Intradural injection of old salvarsan is impossible on account of the caustic soda added to make it neutral, but injection of neosalvarsan into the spinal canal has been tried by several observers. Fatal results have, however, occasionally followed.

An improved method is the intraspinal injection of salvarsanized blood-serum introduced by Swift and Ellis. In this procedure an intravenous injection of neosalvarsan is given, and blood withdrawn from the patient an hour later. As described by L. B. Pilsbury (Jour. Amer. Med. Assoc., Oct. 10, 1914), who used salvarsan instead, as soon as the blood is withdrawn the fibrin is whipped out and the blood diluted with an equal amount of physiologic salt solution. This is left in the ice-box over night, the serum removed the following day and heated at 56° C. for ½ to 1 hour. The intraspinal injection is made by Pilsbury with an ordinary glass cylinder, a small rubber bulb being attached to the lowest arm of a glass T, so as to make slight pressure when needed. The interval before withdrawal of blood was sometimes shortened to ½ or ¾ hour. Thirty c.c. (1 ounce) of 50 per cent. serum was taken as the standard dose, an approximately equal amount of spinal fluid being withdrawn. The usual interval between treatments was 2 weeks. Six of 11 cases of *paresis* showed improvement.

Intravenous Injection Of.—The general impression is that concentrated intravenous injections of old salvarsan are unsafe. Thus, R. Duhot (Quinz. thérap., Mar. 10, 1914) asserts that instances of unfortunate results from salvarsan have shown that the drug becomes increasingly toxic the more concentrated the solution, owing to its ability under these conditions to become precipitated in relatively large masses, thus facilitating embolism. Injection of neosalvarsan in concentrated solution seems far safer.

Necessities of military practice led P. Ravaut (Presse méd., Oct. 11, 1915) to simplify his technique as follows: A 2-c.c. (32 minims) glass syringe, good hypodermic needle, and a little absorbent cotton are boiled for 15 minutes in water as clean as is conveniently procurable. Then, compressing the cotton on the bottom of the receptacle with the outlet of the syringe, water is slowly drawn up, filling the latter. The syringe is allowed to cool completely, as warm water decomposes arsenobenzol. The cooling is accelerated by dropping ether on the syringe barrel. The vial containing the drug is then opened and the water projected into it drop by drop, the vial being meanwhile shaken. When the drug is completely in solution the fluid is drawn up into the syringe through the needle, and the intravenous injection given slowly. Doses of 0.3 to 0.9 Gm. of neoarsenobenzol dissolved perfectly in the small amount of fluid, and were well tolerated provided due rapidity of preparation and slowness of injection were observed.

The feasibility of the method on board even the smallest cruising ships is pointed out by Col. Gibbard (Jour. Royal Army Med. Corps, Nov., 1914). In dissolving the drug he prefers a small glass beaker to a porcelain crucible, the former rendering it easier to see that the solution is clear. The 1¼-inch platino-iridium needle used for intramuscular injections of mercury, is preferable to that supplied with the Record syringe. In preparing for injection, Gibbard sterilizes the syringe by boiling, and places it in sterile water to cool. When there are several cases he uses 2 syringes alternately. The needle is sterilized by standing in absolute alcohol, then placed in sterile cold water ready for use. A test-tube full of tap-water is boiled, cooled to below 70° F., and then poured into a Jena glass beaker up to a 10-c.c. mark. The neosalvarsan is then opened and dissolved, and the solution drawn into the syringe with the needle attached, air expelled, and the needle detached and placed in sterile water. A tourniquet is applied, a prominent vein painted with iodine solution, the skin over the vein picked up, and the needle inserted into the tissue between it and the vein, and then into the vein.

J. H. Blaisdell (Boston Med. and Surg. Jour., June 4, 1914) in 341 concentrated intravenous injections of neosalvarsan, noted dizziness, headaches, and diarrhea in mild degree in some instances during the first 24 hours, especially after the first injection. Twenty-four untreated cases were given 4 weekly injections of 0.45 Gm. (7 grains), followed by a Wassermann 7 days later. While the active symptoms and lesions yielded readily, serologically the concentrated neosalvarsan proved inferior to old salvarsan.

Laurie (Jour. Amer. Med. Assoc., Dec. 6, 1913) has adapted the arm band, the inflating bulb and relief cock of a sphygmomanometer as a simple tourniquet in giving salvarsan.

In *infants*, injections or neosalvarsan into the external jugular, epicranial, or dorsalis pedis veins were successfully performed by G. Blechmann (Paris méd., Jan. 31, 1914) in 100 cases. All injections were made without incision. Neosalvarsan was dissolved, whatever the dose, in 2 c.c. (16 minims) of twice distilled water. Three assistants were found necessary—2 to immobilize the head and trunk respectively (the child being also wrapped in a blanket), and the third to disinfect the field, etc. For injection in the external jugular, the child's crying efforts suffice to distend the vein. The needle, with *barrel filled* and attached, can usually be inserted easily into the vein. Where there is difficulty with the jugular, relatively large epicranial veins in the temporal region can generally be found, into which a small needle can be inserted, while the point of confluence of the temporal veins is pressed upon with a finger. As a third resort a vein on the dorsum of the foot can be used, with a constricting band above the malleoli. Series of 5 to 7 weekly or bi-weekly injections, with intervening periods of 6 or 8 weeks were given, the initial dose being less than 0.01 Gm. (1/6 grain) per kilogram of body weight, and the dose ultimately attained 0.015 Gm. (1/4 grain). In infants less than a year old the total amount seldom exceeded 0.02 Gm. (1/3 grain), and in cachectic ones but 0.01 Gm. (1/6 grain) was injected. Hematoma after the withdrawal of the needle can be obviated by immediate local pressure.

Oral Administration Of.—Schamberg, Kolmer and Raiziss (Jour. Amer. Med. Assoc., Dec. 23, 1916), administering arsenobenzol to animals, noted a distinct destructive influence on trypanosomes in the blood. Clinically 1/2 grain (0.03 Gm.) of arsenobenzol in luteric capsules was given after each meal to about 30 patients in various stages of syphilis. Usually it required about 3 weeks to cause disappearance of a secondary macular or papular eruption, but 1 case, a large papular syphilide of the face, disappeared in 3 or 4 days. Tertiary nodular lesions also required 2 to 3 weeks. To prevent oxidation of the arsenobenzol in the capsule, sodium hydrosulphite was incorporated with it, and a small amount of bismuth subgallate added to prevent diarrhea. Inaccessibility of veins through excessive adiposity, thrombosis of veins due to repeated injections, or similar reasons preventing intravenous injections, justify oral use of salvarsan, which is also indicated as a supplementary treatment to intravenous use, to keep the drug continuously supplied to the blood. In oral treatment of syphilis salvarsan is preferable to mercury.

Subcutaneous Injections Of.—Administration of neosalvarsan under the skin has to some extent come into vogue through the introduction of the epifascial method of W. Wechselmann. Already in 1913 (Münch. med. Woch., June 17, 1913) this observer was able to report 1000 injections without necrosis in a single case. A solution of 0.1 Gm. (1 1/2 grains) of neosalvarsan in 1 c.c. (16 minims) of sodium chloride solution seemed best tolerated, while the quantity of fluid which just fell short of producing pain by pressure on the tissues was about 3 c.c. (48 minims). Most patients felt slight pain. The fluid must not be injected into fatty tissue, fascia, nor muscle, but strictly *over* the fascia. One can soon learn to appreciate the elastic resistance of the fascia, particularly in lean persons, who should at first be selected as subjects. The trochanter major is the seat of election.

To test the correctness of position of the needle, the writer always injects some salt solution first. With an easy working syringe one can feel that a cavity is being injected into. Massage of the surrounding tissues is advisable. Whenever practicable, the writer follows up an intravenous injection of salvarsan with 1 or several subcutaneous injections of 0.5 Gm. (7½ grains) of neosalvarsan to obtain a persistent action.

The *epifascial method* is deemed better by A. L. Wolbarst (Med. Rec., June 3, 1916) than the intramuscular method, because it provides ready absorption without necrosis, infiltration, or inflammation. The needle is plunged into the gluteal muscle and then withdrawn until the point turns freely from side to side. A local anesthetic solution may be first injected which will flow freely back through the needle when the proper level is reached.

Contraindications, iv. 176

According to Luithlen (Therap. Monats., Jan., 1914), subjects should be excluded from salvarsan treatment who exhibit depressed vitality from any cause other than syphilis, or have signs of cardiovascular injury or kidney trouble, chronic poisoning from alcohol, nicotine or lead, or an infectious disease including florid syphilis itself. Especially dangerous are tuberculosis, severe gastro-intestinal disease and nervous affections with destruction of pathologic tissue.

According to T. Pontano (Policlinico, Apr., 1915), insufficiency of the heart or kidneys is an absolute contraindication, and of the liver, a relative contraindication.

In a woman of 50, and in a robust boy of 12 at the second day of scarlet fever, Rindfleisch (Berl. klin. Woch., Mar. 24, 1913) observed death closely following an intravenous infusion of neosalvarsan. Necropsy in both cases revealed a marked status thymo-lymphaticus.

Physiological action, iv. 177

In rabbits Alverens (Arch. f. exper. Path., Bd. lxxii, 1913) found that long-continued administration of salvarsan intravenously brings about a slight nephritis. After toxic doses given during a short time, a marked fall of blood-pressure and serious renal insufficiency occurred, but lesions were not visible in the kidneys. Where nephritis had been previously excited by cantharidin, rabbits showed marked sensitization to salvarsan, whereas if the nephritis had been caused by mercury or chromic salts, that is, was essentially tubular, no ill results were obtained till large doses were employed. Animals with artificial tricuspid insufficiency, with resulting congestion of abdominal organs, bore salvarsan worse than others with aortic leakage.

The influence on blood-pressure was studied by Rolleston (Brit. Med. Jour., Aug. 21, 1915) in 100 cases in which the drug was given intravenously for syphilis, almost all cases being in the secondary stage. In 77 cases the injection was followed by a fall in both the systolic and diastolic pressures. The average fall of systolic pressure was 16 mm. Hg. and of the diastolic pressure 13 mm. Hg.

The blood-pressure 7 hours after the injection was usually lower than before. The average of blood-pressure on subsequent days was also usually lower, more markedly in the diastolic than in the systolic pressure. During the injection both pressures were nearly always high.

Studying the concentrated solutions, Stern (Deut. med. Woch., Apr. 6, 1916) found that with such solutions elimination proceeds more slowly than when salvarsan is infused in dilute solutions. Clinically, the longer the drug stays in the blood the better the therapeutic effect.

Poisoning, iv. 182

An arsenic exanthem and an exanthem due to a special idiosyncrasy, usually urticarial in type, are recognized by Neisser (Münch. med. Woch., Jan. 25, 1916) as salvarsan sequelæ. The idiosyncrasy may be local, from some preceding injury of the skin, and is apt to be manifest each time salvarsan is given, whereas the tendency to the arsenic exanthem eventually dies out. In 2 patients an acquired idiosyncrasy could be shown at will by applying locally a drop of the arsenic preparation.

Beeson (Urologic and Cutan. Rev., Sept., 1915) discusses the toxic symptoms, especially those studied by Milian, who, from their resemblance to the effects of amyl nitrite, calls them "crises nitritoides." The onset is very sudden, often during an intravenous injection or soon after. The face becomes flushed, the conjunctivæ injected, the lips and tongue may swell, marked chilliness with rigors occurs, perspiration is profuse, and usually nausea followed by vomiting is noted. Some attacks are accompanied by severe headache, epiphora, and dyspnea, with intense pain in the precordium or epigastrium. Fever and diarrhea are not uncommon. The pulse is usually rapid. A severe attack may end in syncope. Similar, but milder, attacks on the third or fourth day are known as secondary nitroid crises.

A "serous apoplexy" has also been noted after intravenous use of salvarsan and neosalvarsan. Suddenly, 3 or 4 days after the injection, the patient becomes agitated and develops epileptiform seizures, clonic and tonic, which become more and more frequent. Coma ensues, with death on the fourth day in most cases. At autopsy engorgement of the lateral ventricles and cerebrospinal canal have been noted. Fatal cases of nitroid crises have shown marked congestion of all the viscera. Adrenal insufficiency plays the leading rôle in these attacks, which usually respond to adrenalin. Ergotin or hypophysin do not act as well. **Adrenalin** is given intravenously in the grave cases, especially those of serous apoplexy. The usual route is the intramuscular, with a minimum dose of 1 c.c. (16 minims) of a 1:1000 solution. In marked cases even 4 c.c. (1 dram) can be given. Prophylactically the adrenalin should be given about 10 minutes before the injection, in the thighs or buttocks. For prolonged action one may add pills of 0.25 mg. (1/250 grain) adrenalin, 2 pills 3 times a day. For a crisis during an injection one should stop at once, and give adrenalin as described. A slightly acid mixture of salvarsan can easily cause a crisis.

R. T. Woodyatt (Jour. Amer. Med. Assoc., May 29, 1915) reports the case of a man aged 45, with luetic aneurism, who received 3 doses of salvarsan of 0.3, 0.3 and 0.4 Gm. (5, 5 and 6 grains) within 8 days. Forty-eight hours after the lost one there developed fever, headache, and slight nausea. The bowels had not moved. The urine was scanty, and later none was passed, but there was no edema or ascites. It was thought probable that water was accumulating in the liver and kidneys, etc., and the treatment was based on the theory of edema of Fischer, viz., accumulation of acids. The patient was given 200 c.c. (6⅔ ounces) of **Fischer's hypertonic sodium chloride with sodium carbonate solution** by bowel, and 2 hours later the dose was repeated; he was allowed no food or drink except lemonade, to which sodium bicarbonate had been added until there was no more effervescence. In 4 hours the patient had a watery stool and passed urine. A third enema was given. Recovery followed without other treatment.

J. Danysz (Presse méd., Sept. 14, 1916) maintains that Milian's "nitritoid attacks" are due to vasodilatation, and also to the formation of a precipitate which is arrested temporarily in the capillaries. A sufficiency of alkali with the drug will prevent these effects in persons with normal blood-composition. Precipitates are favored by the presence of sodium chloride and especially phosphates, carbonates, sulphates, oxalates and magnesium chloride; on the other hand, they are lessened, thus diminishing the after-effects, by slow use of very dilute solutions, prepared with isotonic sugar or glycerin solution, and by simultaneous injections of anesthetics or vasoconstrictors. The neutral drugs, such as neoarsenobenzol, do not precipitate in the presence of chlorides, sulphates, or carbonates, and thus only exceptionally cause early untoward effects; serious late results, however, are more frequent. With the whole group formation of a non-noxious or slightly noxious precipitate is an essential condition for therapeutic efficiency. The sodium combined products are thus more active than the neutral (neo) ones, and when well prepared are less dangerous.

Ormsby, Mitchell, Moody and Ellis (Jour. Amer. Med. Assoc., Dec. 9, 1916) report a marked increase in the severe reactions following injection of salvarsan and neosalvarsan recently imported from Germany.

Willcox and Webster (Brit. Med. Jour., Apr. 1, 1916), reviewing the toxicology of salvarsan, note that in most cases only slight symptoms follow the injection, such as nausea, vomiting, slight fever, and headache, and mild diarrhea. Shock is rare. High fever is sometimes observed. The more severe symptoms are of 2 types: (*a*) Those of arsenical poisoning, viz., rigor, headache, pains in the extremities, nausea, vomiting, furred tongue, diarrhea, injected conjunctivæ, erythema, and slight jaundice. There may be some delirium, followed by stupor, with albumin and casts in the urine. (*b*) Those of profound toxemia, appearing within three days, viz., collapse, mental disturbances, stupor, muscular twitching, pains in the abdomen and back, epileptiform convulsions and coma. The prognosis is usually bad. Albumin and casts appear in the scanty urine. The liver, heart, and kidneys show degenerative changes, and the symptoms are due to a profound autointoxication similar to uremia. In early intoxication there should be used, in addition to **stimulants**, **venesection**, and repeated rectal administration of 3 drams (12 Gm.) of **sodium bicarbonate** in normal saline solution:—

℞ *Sodii citratis* .... ʒj (4 Gm.).
Sodii bicarbonatis,
Potassii citratis āā ʒss (2 Gm.).
Caffeinæ citratis . gr. iij (0.2 Gm.).
Syrupi aurantii,
Aquæ, ad ......āā ʒj (4 c.c.).
M.

In coma, nourishment should be continued by **stomach** or **nasal tube**. In case of collapse **strychnine** may be given every 4 hours in 1/40-grain (0.0016 Gm.) doses, and **oxygen**, or oxygen passed through alcohol administered.

The necessity of refraining from giving salvarsan where a patient has some febrile infectious process or has just recovered from an infection is emphasized by Gutmann (Berl. klin. Woch., Aug. 3, 1914). Yakymoff found that mice given an intravenous injection of minute amounts of colon bacillus endotoxin and then salvarsan showed the toxicity of the latter enhanced nearly 3-fold. Marked infection with trypanosomes enhanced the toxicity 15-fold. Salvarsan should not be injected for several days after a febrile infectious process. Trouble may also be anticipated if it is injected during the incubation phase of an infection.

A case of Bell's palsy and neuritis of the eighth and twelfth nerves following salvarsan is reported by Dabney (Interstate Med. Jour., May, 1915). Such nerve lesions, he believes, would be lessened in number by a preliminary course of mercury.

Ocular and auditory impairment along with or soon after salvarsan are reported by Terrien and Prélat (Paris méd., May 30, 1914) in 4 cases of secondary syphilis. In at least 2, the phenomena could be definitely ascribed to the syphilitic process rather than to a drug effect. It is generally accepted that ocular complications during salvarsan treatment are syphilitic, and since the ear complications occurred simultaneously in these 2 cases, they were evidently likewise syphilitic. In the other 2 cases the complications seemed directly due to the salvarsan.

Fatal Poisoning.—Wadia (Brit. Med. Jour., Jan. 6, 1917) reports from India, the case of a Sepoy, aged 23 years, thin and somewhat anemic, with a secondary rash, mucous patches and general adenitis. Salvarsan 0.5 Gm. (7½ grains), was given intravenously. A good deal of vomiting followed. Six days later he was deeply jaundiced; the stools contained bile and the urine traces of bile and albumin. The liver became enlarged and tender, and the pulse regular but weak, with temperature normal. Collapse and death occurred 6 days later. There must have been storage of arsenic in the liver, causing acute fatty degeneration. Three similar cases have been recorded.

Therapeutics, iv. 198

In Syphilis.—Pharmacological and clinical evidence, according to Schreiber (Münch. med. Woch., lxi, 522, 1914), prove that salvarsan kills all the spirochetes it can reach, while mercury promotes the immunity reactions. He believes mercury does this by increasing the protective substances in the recipient.

Studying the influence of salvarsan on immunity in infected animals, F. V. Verbitsky (Roussky Vratch, May 9, 1915) concludes that the destruction of the parasites causes the formation of antibodies which take part in the final sterilization of the organism, and produce a temporary immunity. The latter lasts but 4 to 15 days, and is not transmitted from mother to offspring, either directly or through the milk.

In comparative animal tests conducted by Schamberg, Kolmer and Raiziss (Jour. Amer. Med. Assoc., Dec. 18, 1915) with German arsenobenzol (salvarsan) and arsenobenzol made by themselves, the domestic product did not differ from the imported either in toxicity or trypanocidal powders. In animals neosalvarsan proved less effective than salvarsan, a fact which agrees with the best clinical experience. The domestic arsenobenzol was given to a large series of syphilitic patients without accident, and the results were indistinguishable from those with salvarsan.

A comparative study of salvarsan and neosalvarsan was carried out by Trimble and Rothwell (Jour. Amer. Med. Assoc., Dec. 30, 1916). Salvarsan was given intravenously in an initial dose of 0.3 Gm. (5 grains) and in subsequent doses of 0.6 Gm. (10 grains); neosalvarsan, in 0.45- and 0.9- Gm. (7 and 14 grains) doses. The disappearance of the lesions was equally rapid and complete. Reactions were much more frequent after salvarsan than neosalvarsan. Serologically, neosalvarsan seemed decidedly the better drug, there being 40 per cent. of negative reactions as against about 7 per cent. A course of 4 injections of either drug alone is insufficient treatment, and should always be followed by mercurial treatment. More than 4 doses of the arsenical should also usually be given.

In Non-specific Diseases.—Best (Jour. Amer. Med. Assoc., Aug. 1, 1914) found the following conditions uninfluenced: bilharziasis, carcinoma, chancroid, erythema multiforme, Hodgkin's disease, psoriasis, rhinoscleroma, scarlet fever, sarcoma, trichinosis and trypanosomiasis. A second group was sometimes improved, viz., anemia, keratosis follicularis, lichen planus, mycosis fungoides, pemphigus, pellagra, pityriasis rubra, the tuberculides and certain parasitic states, viz., Aleppo boil, leprosy, lupus vulgaris and tuberculosis. Improvement in a case of leprosy was notable. A third group divides itself into (1) filariasis, frambesia, relapsing fever, and Vincent's angina, in which the results are no less brilliant than in syphilis. Other diseases benefited are amebic dysentery, anthrax and malaria. (2) Acanthosis nigricans, chorea, Duhring's disease, scurvy, ulcus tropicum, variola, and verrucæ planæ. Here the etiologic factors are obscure, and the good results cannot be exactly accounted for. In Duhring's disease results were brilliant. On the whole, salvarsan is specific in diseases caused by any variety of spirillum. If used with caution in repeated doses over a long period it has therapeutic value in diseases in which previously arsenic gave indifferent results. As an adjuvant it is useful in diseases in which a quick tonic effect is desired, depending on other drugs for the ultimate result. Intravenous use is advisable in diseases in which a specific action is desired; full dose intramuscular injections repeated once or twice at long intervals (8 weeks) in those cases in which the tonic alterative effect is desired, as well as a certain specific action; and small, frequent (week or 10 days) doses intramuscularly, over a long period of time, in chronic diseases in which a purely tonic effect is desired.

Local Use.—Use of salvarsan and neosalvarsan in local infections due to spirochetes, such as Vincent's angina, simple gingivitis, stomatitis, noma, alveolar abscesses, and pyorrhea alveolaris, is advised by Gerber (Münch. med. Woch., lx, 634, 1913). They may be applied in 5 to 10 per cent. aqueous or glycerine solutions or even in powder form. In severe cases with general symptoms, or those which resist local treatment, they may also be used intravenously.

Diphtheria, iv. 230

According to Harris and Wade (Jour. Exper. Med., May, 1915), diphtheroids are widely distributed in nature, being present in the air, on the body surface, at times through contamination. They may also be indigenous in the deeper tissues. They constitute a broader field of saprophytism than is generally appreciated. Diphtheroids can be cultivated from various pathologic tissues to which they bear no etiologic relation, such as lesions of tuberculosis, leprosy, blastomycosis, tertiary syphilis, tumors, etc.

The pus-generating diphtheroid bacillus was found in 200 cases of various suppurations in wounded soldiers by Pavlovsky (Russky Vratch, xiv, No. 31, 1915) in 6 per cent, in pure cultures, and in 6 per cent. mixed with staphylococci. Clinically there is suppuration with formation of grayish or whitish-gray pus, moderate fever (102° C.), and occurrence of fistulas, but the infection seems to be localized and the prognosis good.

During a diphtheria epidemic in the French army, Guiart and Fortineau (Presse méd., June 3, 1915) took throat cultures 920 times in 270 patients. Eighty-nine cases of diphtheria were treated. Instances of transformation of the short type of diphtheria organism into the long, and of the long type into the short were observed; the theory that these types are but different forms of the same organism was thus confirmed. The virulence of the organism seemed to vary directly with its length.

In the opinion of S. T. Nicholson, Jr., and J. F. Hogan (Jour. Amer. Med. Assoc., Feb. 14, 1914), the local use of lactic acid bacilli and sour milk in 9 cases are encouraging enough to warrant further study.

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This question of diphtheria bacilli carriers has received considerable attention. In a study by Renault and Lévy (Arch. de Méd. des Enfants, Sept., 1915), a total of 784 smears were taken, including some from the relatives of 44 of the children. The number of carriers invariably showed a marked increase when a child entered who had recently passed through diphtheria, or a child developed it in the school or ward. The closer neighbors of the diphtheria case nearly always had diphtheria bacilli in their throats.

Long clinical experience showed William Ewart (Brit. Med. Jour., Dec. 11, 1915) the curative value of a **coating of oil** applied to the nasopharyngeal mucous membrane in diphtheria, influenza, pertussis, tonsillitis, etc. For this purpose **jasmine oil** was most satisfactory, being nonirritating. With the patient reclining and head thrown far back, half a medicine dropper full of the oil should be introduced into the nostrils drop by drop. The position should be retained for a minute, after which the head should be rotated, first to one, then to the other side.

In the treatment of diphtheria carriers the most satisfactory results obtained by Ruh, Miller and Perkins (Jour. Amer. Med. Assoc., Mar. 25, 1916) were secured by **removal of the tonsils and of adenoid tissues.** No unfavorable results followed, though virulent bacilli were present.

Kaolin was used by Rappaport in diphtheria carriers with favorable results. He now reports (Jour. Amer. Med. Assoc., Mar. 25, 1916) further experiences. The **kaolin** should be dried and finely powdered and blown into the nose with a rubber bulb. Six treatments at 2-hour intervals should be given each day. Before each treatment the kaolin remaining from the preceding should be removed by means of a mild alkaline spray, such as a solution containing 2 per cent. each of the **bicarbonate** and the **biborate of sodium.** The **tonsils** should be **removed** if kaolin fails to sterilize.

Several instances are recorded by S. A. Friedberg (Jour. Amer. Med. Assoc., Mar. 11, 1916) in which, after **tonsillectomy** and **removal of adenoids**, disappearance of the bacilli occurred in 2 days.

Labbé and Canat (Paris méd., Jan. 6, 1917) report very favorable results from insufflation of a powder made from the serum of horses previously **injected with diphtheria bacilli killed by heat.** This powder was insufflated into each nostril of the diphtheria carriers 4 times a day. One teaspoonful of the powder in the atomizer bottle serves for 30 insufflations.

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Recently, according to W. H. Park (Boston Med. and Surg. Jour., Aug. 26, 1915), there has been much variability and uncertainty as to dosage and the aim appears to be to give exceedingly large doses. In truth there are seldom present at one time more than 100 units of toxin even in the most severe cases, and 1000 units of **antitoxin** given intravenously has an equal effect to 20,000 units given under the skin. The Schick reaction aids in the appreciation of the effects of antitoxin. A single dose of antitoxin should be sufficient.

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In the 30 years just passed we have witnessed, as stated by W. H. Park (Boston Med. and Surg. Jour., Aug. 26, 1915), the growth and decay of the hope that by isolation and terminal disinfection the incidence of diphtheria might be reduced. The total mortality is just as high as ever. Passive immunity will protect for a few weeks; 1000 units of antitoxin will confer immunity for about 3 weeks. Its short duration led to efforts to increase it. Behring used a toxin-antitoxin mixture for this purpose. Such mixtures are useful in speeding and increasing the antitoxin yield of horses. Theobald Smith suggested and Behring applied it. Individuals deprived of natural immunity are with great difficulty made immune, while indeed 25 per cent. of the natural non-immunes cannot be made immune at all. For practical purposes, passive immunity remains the chief measure. Bacterial vaccines virtually failed to give immunity. Present efforts aim to combine toxin-antitoxin and vaccine therapy to increase both antitoxic immunity and antibody immunity.

Schick described in 1913 a method known as the **Schick test**, by which we find out the susceptibility of an individual to diphtheria: He injects a small amount of diphtheria toxin ($\frac{1}{50}$ of the minimum lethal dose for a guinea-pig weighing 300 grams). This is so diluted that it is contained in 0.1 mil of fluid. This should be injected with a very small needle, taking care that it goes directly into the skin, the flexor surface of the forearm being the chosen locality. A small, raised, white-looking spot should result. Within 24 hours these areas become somewhat cyanotic, slightly edematous and reddened. In 48 hours this passes off and a brownish pigmentation follows. This reaction occurs only in persons without natural antitoxin in their blood, and if such a reaction is positive, it indicates that less than 1/30 of a unit of antitoxin is contained in 1 mil of blood, and the person may be considered susceptible to diphtheria. Children sick with diphtheria give the reaction when tested before having received the antitoxin serum. The newly born rarely give the reaction; they are usually immune (93 per cent.).

According to Zingher (Amer. Jour. of Dis. of Child., Apr., 1916) from 17 to 32 per cent. between the ages of 2 and 16 years give a positive reaction.

Summarizing their results, W. H. Park and A. Zingher (Trans. Amer. Assoc. of Immunol.; Jour. Amer. Med. Assoc., July 8, 1916) conclude that it is advisable to immunize children soon after the first year of life, giving protection at a time when the disease is most dangerous. In addition, such children show only mild local and constitutional symptoms after the injections. An immune child population could thus be developed, and the bacillus carrier would probably soon disappear.

Koplik and Unger (Jour. Amer. Med. Assoc., Apr. 15, 1916) enumerate several disadvantages in the Schick test as usually carried out, including technical difficulties and a considerable proportion of pseudopositive reactions. They have devised a needle, bent to an angle of 170° one-quarter inch from its point, and mounted so as to leave exposed only the portion distal to the bend. This needle, when dipped into pure diphtheria toxin, and immediately thrust endodermally, carries with it an almost immeasurable amount of fluid—about 0.00014 c.c. Parallel observations were made with this simplified technique and the accepted Schick technique, and with perfect concordance as result. Traumatic pseudopositive reactions were entirely absent, and three-quarters of the pseudopositive reactions were eliminated.

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Attempt by Kalima (Finska Lakare Handl., lviii, No. 3, 1916) to use local anesthesia for reduction of luxations were successful in 12 out of 15 cases. The muscles relaxed under the local anesthesia, so that sometimes the bone could be slipped into place without reduction maneuvers. Eleven were shoulder and 2 hip cases. The anesthetic was injected through the intact skin, from 10 to 40 c.c. (2½ to 10 drams) of a 1 per cent. solution of novocaine being used, or, in case of the femur, up to 50 or 70 c.c. (1⅔ to 2⅓ ounces).

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In dislocation of the semilunar bone of the carpus, according to H. Vulliet (Revue méd. de la Suisse Rom., Feb., 1915), prompt treatment is essential. The diagnosis can often be made promptly without the aid of the X-rays, local swelling being often slight. The carpus is thickened anteroposteriorly, and a bony prominence can be felt on the palmar aspect of the carpus. In fresh dislocations one should attempt to secure reduction by vigorous traction on the hand and direct pressure on the displaced semilunar. Where the dislocation cannot be reduced, as is nearly always the case after 2 or 3 weeks' delay, operative removal of the semilunar bone is necessary, giving better functional results than incision and reduction.

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  - of the hip, iv. 304, 324

W. Blanchard (Jour. Amer. Med. Assoc., Nov. 20, 1915) notes a diversity of forms of congenital hip dislocation as shown by the X-rays. The best position to fix the hip in the plaster-of-Paris spica is thus sug-

gested by the rays. The dangers of fracture or other injury are decreased when the head is reduced over the shallower lower rim of the socket. From 3 to 5 years of age is the best time. The prognosis is favorable in posterior dislocation, unfavorable in forward dislocation, and unfavorable in upward dislocation if on rotation of the leg the head can be felt both anteriorly and posteriorly. The older the child the more secure the replacement, if it can be made. Reduction by steps can be obtained in older children with 5 cm. or more of shortening. Reduction should be delayed in patients of 3 years or younger, and that show 2 cm. or less of shortening. The case must be watched by radiography before and after reduction.

J. P. Jones (Interstate Med. Jour., xxii, 32, 1915) dresses his cases in plaster-of-Paris casts from above the pelvis to below the knees, with the thigh in marked abduction and external rotation. The patient is then put on a Bradford frame elevated about 2 feet, allowing the leg and foot to drop over, thus correcting external rotation and causing pressure against the acetabular cavity. The patient walks after 2 months, supported by an attendant. After 4 to 6 months the cast is changed, and the abduction gradually corrected to the normal position in 18 months.

novocaine anesthesia in, vii. 106
of the knee, iv. 328
of the lens, see Crystalline Lens, Dislocation of, iii. 702; also this Index.
of the lower cervical vertebræ, iv. 307
of the lower jaw, iv. 306
of the lower radioulnar joint, iv. 321
of the metatarsus, iv. 332
of the muscle, vi. 765
of the occiput, iv. 307
of the patella, iv. 330

Albee (Med. Rec., Aug. 14, 1915) applies the bone graft wedge treatment in habitual dislocation of the patella. A semilunar incision is made outside the patella, and the external condyle incised with an osteotome on its external surface, making an incision from 1½ to 2 inches long, which allows the anterior surface of the condyle to be raised by producing a green stick fracture. Into the wedge-shaped gap thus formed a section of bone from the crest of the tibia is fitted and anchored by dowel pins also made from the tibia. The further displacement of the patella is blocked by the elevation of the external condyle.

of the pelvis, iv. 323
of the penis, vii. 340
of the phalanges, iv. 323
of the radius, iv. 320
of the ribs, iv. 308
of the semilunar cartilages, iv. 329

Griebenow (Journal-Lancet, Apr. 1, 1917) reports 10 cases of injury of the semilunar cartilages, 5 fractures and 5 displacements, all of the internal cartilage. Partial extirpation was done in 7 cases, complete extirpation in 2 cases, and suturing in 1 case. The last gave the poorest results. While the best treatment is extirpation, in a few early cases cure or improvement can be obtained by immobilization for a number of weeks or months with plaster casts and rest in bed. Reduction should always be attempted by flexing the knee, and, in case of loose internal cartilage, rotating the tibia outward while pressing over the cartilage and then quickly rotating the leg inward with a sudden extension. Where there is posterior displacement, fracture, or a dislocation deep in the joint, complete extirpation alone can cure.

of the shoulder, iv. 310

To reduce a shoulder dislocation without anesthesia or assistance, Angelvin (Med. Press and Cir., c, 464, 1915) first raises the dislocated arm in abduction, next passes the patient's arm over the operator's neck, making a fulcrum of the patient's side to exert traction. He firmly holds the dislocated arm with his far hand, and makes extension by twisting his shoulders. With his free hand he can manipulate and direct the movements of the humerus and its head.

Dislocations (*continued*).
  of the spine, iv. 307
  of the sternum, iv. 308
  of the tarsus, iv. 332
  of the thumb, iv. 322
  of the ulna, iv. 320

A. F. Jonas (Trans. Amer. Surg. Assoc., May, 1916) reports the case of a man who had not been able to turn nor raise his head for more than a year, due to manipulations by an osteopath for "generalized rheumatism." He had unbearable pain, and any attempt to rotate his head caused marked spasm of all the cervical muscles. X-rays revealed retrodisplacement of the atlas. Under ether anesthesia, guarded rotary manipulations with pressure over the prominent cervical spine were carried out without results. Through a posterior incision the arch of the atlas together with the left superior articular surface was then removed with a rongeur forceps. The right atlo-occipital articulation being immovable, enough of the articulation was removed to permit of fairly good anteroposterior movements. The immediate operative effect was to raise the head and enable the patient to masticate and speak freely. With effort the head could be elevated to a normal position. Pain and muscular rigidity disappeared.

  phalangeal, stovaine anesthesia in, viii. 398
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  subastragaloid, iv. 331
  subglenoid, iv. 315
  tibiotarsal, iv. 331
Displacements of the eyeball, vii. 209
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  of the tube, vii. 237
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  nodular sclerosis, see Multiple Sclerosis, viii. 585
  pneumonia, see Bronchopneumonia, ii. 675; also this Index.
Distichiasis, iv. 729
  electrolysis in, iv. 729
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Distichiasis (*continued*).
  excision of misplaced cilia in, iv. 729
  Jaesche-Arlt operation in, iv. 729
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  and hematuria, v. 398, 399
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  lanceolatum, vii. 320
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  treatment same as Caisson Disease, iii. 542
    calomel in, iii. 547
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    vibratory massage, iii. 546
Diverticula of esophagus, iv. 600
Diverticulitis, intestinal.

Diverticulitis.—This condition, though seldom recognized, is relatively common. It consists of hernial protrusions formed of the mucosa of the descending colon or sigmoid flexure (seldom above and ceasing at the rectum) through the thinned muscular layer. The protrusions may be very numerous—several hundred in some cases—and vary in size from that of a millet seed to that of a cherry, often the latter. They often contain fecal masses which assume the density of concretions. All the coats of the intestine may be involved; the diverticula may ulcerate through these, and their contents awaken peritonitis; or the latter may be caused by pathogenic organisms which penetrate the gut. Acute or gangrenous inflammation of a diverticulum with ulceration into the bladder may occur.

[A personal case showed adhesion to the posterior portion of the bladder with considerable thickening of the latter at the area of contact. This area was finally perforated, and fecal matter passed into the bladder, though in small quantities, which were voided by the urethra. A mild cystitis resulted, but this ceased after resection of the sigmoid flexure and closure of the bladder by W. Wayne Babcock, of Philadelphia. Though colon bacilli persisted in the urine some time, recovery ensued. C. E. DE M. S.]

Symptoms.—No symptoms may suggest the presence of diverticulitis until perforation occurs, causing peritonitis, left iliac abscess, cystitis, etc. There may be pain of a neuralgic character deep down in the pelvis (as in my case), owing to pressure upon abdominal plexuses or adhesions. Constipation and the passage of repeated small stools, sometimes ribbon-like, often suggest cancer; this is especially apt to be the case when a chronic inflammation of the submucous and serous coats occurs. Any acute catarrhal inflammation may give rise to pain, tenderness, corresponding on the left side to that of appendicitis on the right, and swelling of the left inguinal region, with rigidity of the rectus, fever and leucocytosis, the polynuclears predominating.

Complications.—As a result of infection through intestinal diverticula, J. W. Keefe (Boston Med. and Surg. Jour., Feb. 22, 1917) enumerates the following grave, and not infrequently fatal, complications: (*a*) chronic extramucosal inflammation, frequently resulting in tumor formation and simulating carcinoma; (*b*) peritonitis resulting from the perforation of a diverticulum; (*c*) abscess formation; (*d*) intestinal obstruction, due to adhesions of the inflammatory mass to contiguous structures; (*e*) fistulæ and fistulous tracts, particularly between intestine and urinary bladder; (*f*) chronic mesenteritis; (*g*) metastatic suppuration in the liver; (*h*) malignant changes.

Diagnosis.—*Appendicitis* sometimes causes confusion, particularly when left sided. *Tuberculous colitis* may be identified sometimes by finding tubercle bacilli, pus and blood in the stools; the tuberculin test is helpful.

In 3 cases of diverticulitis with roentgenologic findings reported by R. D. Carman (Annals of Surg., lxi, 343, 1915) the patients were somewhat obese. The salient symptoms were: abdominal pain, usually severe, often localized in the sigmoid or descending colon; constipation was the rule. Vesical symptoms, as frequency and tenesmus, were occasionally noted. In every case where the sigmoid was involved a mass could be felt. Proctoscopic examination was positive in one case where a partial intussusception had taken place. Blood was absent from the stools owing to the extramucosal location of the disorder.

The X-ray findings may aid in the following way: the position of the cecum in differentiating it from left-sided appendicitis. Filling defects may be present in the plates in both carcinoma and diverticulitis, but the presence of extraluminal shadows would suggest diverticulitis. Where a carcinoma developed upon a diverticulitis, the characteristic extraluminal shadows would be present, while if the shadows were absent the growth would suggest a carcinoma.

Phleboliths or calcified glands give shadows resembling diverticula filled with bismuth or barium; if situated high in the sigmoid, palpation during a screen examination may reveal the fact that they do not move with the bowel. Lower down the bowel is not sufficiently movable to make this differentiation. The opaque ingested meal offers less chance than the bismuth enema of detecting diverticula.

Etiology.—Diverticulitis occurs more frequently in males than in females and may occur at any age, though most frequently observed during the sixth decade, and occasionally later. Obesity is present in more than one-half of the cases. Prolonged retention of feces, flatulence, constipation, mesenteric congestion, congenital laxity of the connective tissue around the vessels, and muscular deficiency, local or general, of the intestinal wall, leading to dilatation, are frequent causes.

Treatment.—This depends upon the character of the lesion. Acute peritonitis, cystitis, or intestinal obstruction demand celiotomy and **resection** of the diseased segment with end-to-end anastomosis, after carefully cleansing out the intestine. When recognized before perforation occurs **high enemas, fluid diet** and **rest in bed** sometimes cause an acute attack to cease, and further attacks may be warded off by the frequent use of **saline aperients** to keep the stools soft. **High olive oil irrigations** are also of value.

The surgical procedures that are applicable in most cases, according to J. W. Keefe (Boston Med. and Surg., Feb. 22, 1917) are as follows: through a left rectus or muscle splitting incision in the left iliac region, the left lower quadrant is explored, and if an abscess is found it is drained. Although some surgeons advise the removal of the diverticulum coincidently with the draining of the abscess, deferring this to a later time, when a more extensive operation can be undertaken with less hazard to the patient, is favored by the writer. The two-stage operation often gives good results. A loop of the bowel containing the affected area is drawn through the abdominal wound, and the walls of the normal bowel above and below this mass are stitched together. The two portions of the bowel below the loop of the intestine withdrawn are then sutured to the parietal peritoneum. About 48 hours later the diseased area of the bowel is removed with a cautery, thus completing a colostomy. A secondary operation may be performed at some future time, and the openings in the bowel closed.

In cases of fistula between the bowel and the urinary bladder, the surgeon should first make a careful cystoscopic examination, to determine the size and location of the opening in the bladder. The peritoneal cavity is then opened, the adherent colon and diverticulum separated from the bladder, and the opening in the latter is now closed. The involved colon may then be resected and end-to-end or a lateral anastomosis made, but here, too, the more conservative two-stage operation should be the choice in many instances. As to the relative advantages of lateral compared with an end-to-end anastomosis, the former, when we have sufficient bowel to work with, is preferable on account of the greater tendency in the latter to leakage at the mesenteric border.

Statistics from various authorities have shown conclusively that extensive resections of intestine, done in the presence of infection, as is always the case in operations for diverticulitis, are, in a large percentage of cases, fatal.

Diverticulum, Meckel's,

Pathology.—Meckel's diverticulum, which is found in children with a frequency of 1 in 60 or 1 in 100, is very often, as stated by Bienvenu (Thèse de Paris, 1912; Surg., Gynec. and Obstet., Feb., 1913), the cause of early pathological conditions, of which intestinal occlusion is by far the most frequent. This may be produced mechanically (volvulus, invagination, or strangulation) or by inflammation (an old diverticulitis).

Diverticulitis may be plastic or suppurative. In the latter case the general picture of peritonitis may be present, as in appendicitis. There are 2 phases of inflammatory occlusion—the first, pseudo-appendicular; the second, occlusion. Beyond this the symptomatology is not clearly defined.

Diagnosis.—Meckel diverticulitis may be assumed, accordng to Bienvenu (Thèse de Paris, 1912), when periumbilical pains are present, when there is marked swelling in the umbilical region, with an associated low temperature and quickened pulse; the abdomen only later becomes slightly rigid and tympanitic. The co-existence of another malformation, in particular a tumor or a fistula of the umbilicus, should be taken into consideration in making a diagnosis.

Disease of Meckel's diverticulum seems to be uncommon, although the organ in some form is found in 1 to 2 per cent, of people. According to J. P. C. Griffith (Jour. Amer. Med. Assoc., May 23, 1914), it may be the seat of the following conditions: Strangulation of the intestine by the diverticulum or its remains; persistence of the diverticulum, with an opening at the umbilicus; formation of a cystic tumor; concretions of varying size in the diverticulum; superinvolution of the diverticulum; stenosis of the ileum by a short diverticulum attached to its distal extremity or elsewhere; invagination of the diverticulum, liable to be followed by an ileocecal intussusception; volvulus of the diverticulum, or of the ileum; hernia of the diverticulum; inflammation of the diverticulum.

The diagnosis of diverticulitis is summarized as follows: 1. Localization of pain and tenderness, not so often at McBurney's point as somewhat higher and to the right of the umbilicus, or even about it, or in some entirely different region. 2. An area of puffiness or of firm resistance in this region. 3. Absence or slight degree of meteorism, at least early in the attack. 4. Blood in stools and vomited matter. 5. Previous existence of an umbilical fistula, or of some malformation elsewhere.

E. Kirmisson (Bull. de l'Acad. de méd., Apr. 25, 1916) draws attention to the possibility of confounding intestinal obstruction due to constriction of Meckel's diverticulum with acute appendicitis.

Treatment.—The treatment of intestinal occlusion due to diverticulum varies, as stated by Bienvenu (Thèse de Paris, 1912), with the case—simple resection of the diverticulum, resection of intestinal flexures, or the formation of artificial anus. Whenever in the course of any operation the presence of a diverticulum is discovered, it should in every case be removed. If an operation, following abdominal complaints, should prove the appendix to be in a healthy condition, it will be well to examine the last few centimeters of the ileum for a persistent diverticulum.

In troublesome cases of Meckel's diverticulum open at the umbilicus, forming a fecal fistula, Kirmisson (Bull. de l'Acad. de méd., Apr. 25, 1916) first ligates the pouting margins of the canal to prevent outflow of feces, next incises around the umbilicus through the peritoneum, delivers the diverticulum and loop of intestine to which it is attached, ligates the diverticulum at its base, removes it with the thermocautery, buries the stump, and closes the abdomen. Three cases were thus treated successfully. Infants operated on for this condition should be breast-fed to improve their resistance.

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Dochmius anchylostomum, see Ankylostoma Duodenale, vii. 311
  duodenalis, see Ankylostoma Duodenale, vii. 311 and Hook-worm: Necator Americanus, vii. 313

Donovan's solution, see Arsenic, ii. 119

Dormiol, iv. 336

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  - Scotch, viii. 811
  - spinal, viii. 811
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- Drip sheet or sheet bath, viii. 809
- Dropsy, see also Edema and Ascites, ii. 190, 197; also this Index.
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  - apocynum in, ii. 61
  - buchu in, ii. 695
  - cajuput oil in, ii. 709
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- Dujarier's technique in hernia, v. 484
- Duke's disease, see Fourth Disease, iv. 737
- Dum-dum fever, see Kala-azar, vi. 174
- Dunbar's antitoxin, pollantin, serum, and vaccine, v. 607
- Duodenal catarrh, rhubarb in, viii. 30
- Duodenal regurgitation due to fatty foods, viii. 358

In a study of duodenal regurgitation and the stomach, Spencer, Meyer, Rehfuss and Hawk (Amer. Jour. Physiol., Feb., 1916) employed fractional removal of the gastric contents by the Rehfuss tube. The presence of trypsin and of bile was used in determining the regurgitation. The authors found trypsin almost constantly demonstrable in the fasting and digesting stomach. Normal individuals of the high acidity type usually yielded low trypsin values, while in those of the low acidity type tryptic power was marked. This suggested the possibility of tryptic digestion occurring partly in the stomach as a compensatory action in cases of low acid and pepsin secretion. They found that the introduction of 0.5 per cent. hydrochloric acid into the stomach was followed by a rapid reduction of acidity to about 0.2 per cent. hydrochloric acid or less. The fall in acidity was accompanied by a rise in tryptic values and by the presence of bile. The color of the gastric contents often changed to a yellow or a dark olive or blue green. This color change was attributed to regurgitation of bile from the duodenum, and was absent on a diet of substances which did not cause the outpouring of bile. The tryptic values in the gastric contents usually rose with the color change. **Sodium bicarbonate** in 5 per cent. solution is held in the stomach until sufficient hydrochloric acid is secreted to bring the alkalinity to a point in which it is non-irritating to the duodenum. The retention is accompanied by a high trypsin value, suggesting antiperistalsis in the duodenum in response to an irritant. Sodium bicarbonate in 1 per cent. solution hastens the emptying of the stomach either by increasing the motility of the stomach or opening the pylorus. Sodium bicarbonate solutions do not inhibit human gastric secretion, but seem to have a direct stimulatory effect in some cases. Free hydrochloric acid seems unnecessary for the opening of the pylorus, for the stomach sometimes empties while its contents are still alkaline.

diet in, viii. 359

tube.

According to C. R. Jones (Surg., Gynec. and Obstet., Feb., 1916), the duodenal tube, as used by Einhorn, has been of exceptional service in selected cases. It is the ideal method of rest for the stomach. Certain modifications suggested by Morgan have served to place the treatment on a very practical basis: (1) the longer tube, which allows the food to enter the intestines at a point where it can exert no direct pressure on a duodenal ulcer; (2) the discontinuation of the use of sugar of milk in some cases; (3) the drop-by-drop method.

F. W. White (Boston Med. and Surg. Jour., May 4, 1916) employed Einhorn's tube in 90 cases; 56 for diagnosis, in 34 for treatment. It reached the duodenum in about 30 per cent. of the cases within 15 minutes; in about 30 per cent. more within ½ hour, and in about 20 per cent. more in 1 to 6 hours. In about 20 per cent. the tube had to be left overnight. Difficulties were met in adapting the routine to different sizes of patients and different sizes and shapes of stomachs. The quickest way to enter the duodenum is to get it close to the pylorus within a short time. This is best accomplished by using a light tube with a heavy tip, swallowed by the fasting patient in the erect position, feeding the tube in slowly and steadily.

ulcers, v. 737; viii. 373; see also Gastric Ulcer, this Index.

Diagnosis, v. 740; viii. 377.—The clinical diagnosis of duodenal ulcer has been chaotic until within a recent period, according to W. J. Mayo (Med. Rec., June 12, 1915). The change of opinion as to the frequency of duodenal ulcer has been very remarkable during the last 2 years. Most of the ulcers in the vicinity of the pylorus which had been called pyloric ulcers are in reality duodenal. Gastric ulcers in the terminal 1½ of the pylorus may be mistaken for carcinoma on account of the tumefaction due to edema and muscular hypertrophy. The writer's statistics show 73 per cent. duodenal ulcers to 27 per cent. gastric ulcers. In typical duodenal ulcer the history is the most important diagnostic feature, the roentgenogram second, the physical diagnosis including the use of the stomach tube third, and the laboratory diagnosis a poor fourth.

During the period between June 1, 1915, and June 1, 1916, there were according to Eusterman (N. Y. State Jour. of Med., Feb., 1917), 275 cases of duodenal ulcer and 108 cases of gastric ulcer operatively demonstrated at the Mayo Clinic, exclusive of the cases clinically diagnosed and placed under medical management. In the

275 cases of duodenal ulcer, the typical syndrome was present in 225, or 82 per cent. The gastric ulcer type of syndrome was present in 8 per cent. In the remaining 10 per cent. the clinical features were atypical. Hyperacid gastric contents were noted in 80 per cent., gross pyloric obstruction in 10 per cent., and hemorrhage, single or repeated, in 25 per cent. . Definite Roentgen diagnosis of duodenal ulcer was made in 67 per cent., and the Roentgen examination rendered assistance in a further small percentage.

In a study of 11 cases in the Mayo Clinic of operatively proved duodenal ulcer, Crispin (Interstate Med. Jour., xxiii, 890, 1916) states that the gastric analysis showed an absence of free hydrochloric acid.

According to Koehler and Walker (Northwest Med., xv, 58, 1916), pain in duodenal is not so acute as in gastric ulcer, while remissions of several weeks are the rule. The *hunger pains* which come on *4 hours after meals* are characteristic. It may wake the patient up after midnight. Conversely, in gastric ulcer the pain is usually increased by the intake of food, and soda relieves it. It is localized in a small area in the pit of the stomach, going through to the back, and is apt to be aggravated by exercise.

A symptom described by Stern (Arch. of Diag., Oct., 1915) is very suggestive, *i.e.*, the position of the patient. In trying to stretch out his epigastrium, on account of the relief obtained thereby, he often prefers standing; when uncomfortable on a chair he sits in a slanting position, the chest, abdomen and legs forming a perfect incline. When uncomfortable in bed, he tries to lie as straight as possible, often on the left, but never on the right side. This sign is not present in *gastric ulcer*. In *gallstone colic*, the patient usually lies on his left side, with the legs drawn up. In *appendiceal colic*, as well as in the common *cecal and colon disorders* in general, the body of the patient, when sitting is bent over; when lying, his legs are flexed more or less.

Boas (Deut. med. Woch., Jan. 13, 1916) does not coincide with Moynihan concerning the symptomatology of gastric ulcers. Several French and Danish physicians have preceded him in this attitude. Medical cases are identified by the presence of *occult hemorrhages*. The case should include the delayed or *hunger pain*, at a certain interval after eating, and this phenomenon should show periodicity due to hyperchlorhydria. Actual *blood-streaked vomiting* and *melena* are also observed very frequently in the family history, as is also evidence of *pyloric obstruction*.

Tenderness, according to R. P. Sullivan (Trans. Amer. Med. Assoc.; Med. Rec., July 1, 1916), is acute, and easily elicited over the ulcer site. It occurred in the right iliac region in 15 cases of duodenal ulcer, and in the epigastric region in 5 of gastric ulcers. Vomiting occurred and gave relief at first, but suffering later. Rigidity occurred early. The temperature averaged 99.4° F. (37.4° C.) throughout the series.

R. D. Carman (Amer. Jour. Roentgen., iii. 252, 1916) has employed serial radiography for a year with satisfactory results. He identifies 4 forms of deformities of the bulb: (1) the greatly distorted type, resembling a small pine tree; (2) the niche type, where the actual crater of the ulcer is visible; (3) the incisuria type, single or bilateral; (4) the very small bulb of smooth contour, representing a much contracted duodenum.

In addition to duodenal deformity he regards gastric hypertonus, hyperperistalsis, hypermotility, with a 6-hour residue, valuable diagnostic aids.

Experience in 47 cases operated in the Bier clinic convinced Gerlach and Erckes (Deut. Zeit. f. Chir., cxxxvi, Nu. 4-5, 1916) that there are only 2 symptoms which appear with any remarkable frequency: high degree peristalsis and dilatation often joined with ptosis. These are observed respectively in 62 and 68 per cent.

Deaver (Arch. of Diag., Jan., 1917) states that pain appearing in ½ to 2 hours after eating and not promptly relieved by food suggests gastric rather than duodenal ulcer. Radiating pain is usually to the right in duodenal ulcer, to the left in gastric; in the latter, pain is apt to be more constant and vomiting is more frequent. *Cholelithiasis* can often be differentiated by the very severe colicky pain with sudden, unaccountable onset and mysterious cessation, and by the prompt relief frequently afforded by lavage. In *chronic cholecystitis* the attacks do not last as long as in duodenal ulcer—especially the perforating form—but differentiation is otherwise difficult. *Pancreatic disease* is distinguished by the absence of a definite relation of the attacks to eating or drinking, or to the kind of food taken. Similar considerations apply in *early malignant disease* of the intestines.

Pathology, v. 746; viii, 373.—The usual ulcer of the stomach and of the duodenum in man is primarily due, according to Rosenow (Jour. of Infect. Dis., Sept., 1916), to a localized hematogenous infection of the mucous membrane by streptococci.

In 10 out of 14 ulcers in infants examined by Gerdine and Helmholz (Amer. Jour. of Dis. of Children, Dec., 1915) diplococci were found in great numbers in the ulcer base. Gastric and duodenal ulcer in the newborn was observed by Nuzum (Wisc. Med. Jour., Sept., 1916). In 1 case, a strong healthy girl, 24 hours old, sudden vomiting of 2 or more ounces of blood occurred. This recurred twice. The child finally rallied, and slowly recovered. In a second case there was melena, which proved fatal.

Gastric ulcer cases, according to G. A. Friedman (Arch. of Diag., Jan., 1917), frequently show symptoms of vagotonia, duodenal ulcer more often those of sympatheticotonia. Other suggestive facts are the susceptibility of these patients to drugs acting selectively on the vagus and sympathetic. Experiments suggested that: 1. Adrenal insufficiency causes lesions or ulcers in the stomach in various species of animals. 2. An excess of thyroid, produced by repeated intravenous injections, was probably responsible for the gastric lesions in 3 out of 4 animals experimented upon. 3. Thyroid hypofunction caused duodenal and gastric lesions. 4. Excess of adrenaline by repeated injections led to duodenal lesions in dogs and rabbits. 5. Simultaneous adrenal and thyroid hypofunction did not lead to any lesion in the stomach, nor in the duodenum of rabbits. 6. When, after removal of an adrenal, the other occasionally became hypertrophied, lesions were seen in both viscera in rabbits.

Prognosis, v. 747, viii. 381.—Dividing the cases into 4 groups, the results are now about as follows:—

Simple Duodenal Ulcer.—The usual symptoms are epigastric distress 2 or 3 hours after meals; sometimes hunger pains; long periods of euphoria alternating with comparatively short periods of suffering. Gastric hemorrhage or melena may have occurred once. This group gives a comparatively good prognosis, provided that some form of **rest cure** is rigidly carried out; **rectal alimentation**, then **von Leube-Ziemssen milk diet**; or **duodenal alimentation**; or simply a **milk and egg diet** and **rest abed** for about 2 or 3 weeks. Later on, no overexertion (physical or mental) and a general hygienic way of living.

The oftener the attacks recur the more doubtful the prognosis by medical measures. **Operative intervention** (gastroenterostomy, preferably with pyloric occlusion) offers a pretty good prognosis.

Duodenal Ulcer Accompanied by Pylorospasm and Hypersecretion (alimentary or continuous).—Severe pains and frequent vomiting. Hypersecretion occurs constantly. When the pylorospasm reaches a higher degree slight ischochymia appears off and on.

The prognosis of this group is not very good under ordinary methods,

Duodenal alimentation gives a better prognosis. In case it fails after from 2 to 3 weeks, an operation (**gastroenterostomy with pyloric occlusion**) should be performed.

Duodenal Ulcer Accompanied by Pyloric or Duodenal Stenosis.—Ischochymia is here constantly present. In cases of beginning pyloric stenosis, duodenal alimentation and then stretching of the pylorus may be tried. The prognosis varies. Should there be no improvement, or in case the stenosis is further advanced, so that the duodenal bucket fails to pass, gastroenterostomy should be performed. Results are usually very good. In duodenal stenosis, when situated below the papilla of Vater, there is bile constantly found in the stomach or in the vomitus. The treatment requires surgical intervention and the prognosis then becomes pretty good.

Duodenal Ulcer with Periodically Recurring Hemorrhages.—The chief symptom is profuse hemorrhage (either hematemesis or melena or both), which returns periodically. An interval operation (**gastroenterostomy, eventually with pyloric occlusion**) gives the best results. Yet, hemorrhage may occur even after apparent recovery.

Treatment, v. 747, viii. 382.—As argument in support of prompt **surgical treatment**, Deaver (Arch. of Diag., Jan., 1917) urges the frequent malignant degeneration of ulcers. Perforation occurred in about 15 per cent. Operative mortality in chronic duodenal ulcers was 3.7 per cent; but 1 died among 46 perforated cases, including a previous series. In all but 1 of the cases, a posterior gastroenterostomy was performed; in 17 this was combined with pylorectomy. In 10 cases the ulcer was invaginated and in 5 excised; duodenal plication was performed twice.

Our associate editor, A. Bassler (N. Y. Med. Jour., Mar. 25, 1916) dissents from Mayo's belief that there is no difference between medical cures and the spontaneous remissions; also from his implied conclusion that surgical intervention in all cases is indicated. Referring to 106 cases with definite symptoms of duodenal ulcer, and 36 in whom only the X-rays were positive in 1913 and 1914, he states that of those with definite symptoms (non-perforated), 63 had been operated upon. Of these 4 died from the operation—1 from hemorrhage, 2 from peritonitis, and 1 from post-operative pneumonia. Of the 59 remaining, 34 were free from symptoms over a year later; 13 had more or less symptoms of digestive disturbance, and 12 could not be located.

F. B. Turck (Med. Rec., June 24, 1916) requires **rest in bed** for 2 or preferably 3 weeks, with a preliminary fast of 3 days, when only water is allowed. On the fourth day 800 c.c. of **cornstarch gruel** is given in 1 meal and afterwards 2 meals daily are given with increasing amounts of rice, steamed vegetables and hydrolyzed meat. When meat is given early in the second week it is soaked in cold water for 12 hours, and the juice is expressed and discarded to avoid hyperchlorhydria; the meat pulp is placed in boiling water and steamed for 1 or 2 hours until jellied. He holds that gastric lavage encourages atony, although washing with **silver nitrate** is useful where there is high acidity. **Vaccines** are of service and **blood-serum** checks hemorrhage. **Atropine** is useful to control hypersecretion, while **bismuth, bran, slippery elm, Irish moss, kaolin**, etc., are used to remove micro-organisms mechanically.

According to Wilensky (Trans. Med. Soc. of N. Y.; Med. Rec., Aug. 26, 1916), prolonged, careful after-treatment of the gastric functional disturbances which initiated the ulcerative process is necessary. The post-operative symptoms may mimic the pre-operative symptoms, *e.g.*, vomiting, then pain, pyrosis, and eructations.

Many duodenal ulcers give atypical histories because of coincident disease of the gall-bladder or appendix. William J. Mayo (Med. Rec., June

12, 1915) holds that unless the duodenal ulcer can actually be demonstrated at the operating table, the ulcer operation should not be done. Most ulcers involve the first 2 inches of the duodenum, and 83 per cent. are in men. **Gastroenterostomy** is the operation of choice. **Excision** combined with the **Finney gastroduodenostomy** is occasionally valuable to meet certain indications. **Blockage of the pylorus** is unnecessary unless there are symptoms of impending perforation or hemorrhage. Most "recurrences" after operation are due to improper technique, especially to the use of continuous non-absorbable sutures of silk or linen.

abdominal belt in, v. 748
alkalies in, v. 749
almond oil in, v. 748
bismuth in, v. 747, 749
Célestin Vichy in, v. 747
cool water after meals in, viii. 391
cream before meals in, v. 747
dextrose in, v. 749
diet in, v. 747, 748; viii. 390, 391
duodenal alimentation in, v. 749
enemas in, v. 749
epinephrin in, v. 749
flaxseed water, warm, before meals, in, viii. 391
gastroenterostomy in, v. 748

J. B. Deaver (Med. Adviser, Mar., 1917) finds that simple **excision** is applicable only to small early ulcers favorably situated. Ulcers of the anterior wall of the duodenum usually require excision, **plication** of the duodenum, and a **posterior gastroenterostomy.** Large indurated ulcers in this location are treated by **amputation of the duodenum** below the lesion, which is then purse-stringed and inverted, followed by excision of the pylorus and posterior gastroenterostomy. The same applies to large ulcers on the posterior wall of the duodenum in its first part, providing it is not too adherent. **Posterior gastroenterostomy** with invagination of the ulcer gives the best results in large ulcers. He never operates during acute hemorrhages and considers that the prognosis in perforation depends absolutely upon the time which elapses before operation.

posterior, in, viii. 390
horse serum (normal) in, v. 748
hot applications in, v. 749
ice pack in, v. 749
Lenhartz diet in, v. 748
magnesia (calcined) in, v. 747
morphine in, v. 749
mouth washing in, viii. 390
nitric acid (dilute) in, v. 748
olive oil in, v. 747, 748
ox-bile in, v. 749
rectal alimentation in, v. 749
regulation of bowels in, v. 747
rest in bed in, v. 747, 748; viii. 390
saline purge in, v. 749
scarlet red in, v. 749

Friedenwald and Leitz (Med. Rec., July 22, 1916) used **scarlet red** in 45 cases of gastric and duodenal ulcer. These cases, together with 37 previously reported, show the drug may be given with great benefit in doses of 15 to 20 grains (1 to 1.3 Gm.), 3 or 4 times daily.

sodium bicarbonate in, viii. 186
Duodenitis, see Intestinal Catarrh, v. 706; also this Index.
Duodenum, dilatation of, acute postoperative, viii. 346
atresia of.

M. L. Harris (Jour. Amer. Med. Assoc., Apr. 18, 1914) observed a condition hitherto undescribed: a constriction at the second part of the duodenum with quite distinct, if not characteristic symptoms, due to the remains of a definite and perfectly normal embryological structure. He has now operated in 6 of these cases. There was more or less distress in the epigastrium, coming on some time after eating, and usually relieved by food. Tenderness in this region was also present in all. The trouble was distinctly chronic, often dating from early life. Hyperchlorhydria existed. In no case were evidences of present or past ulcers of duodenum or stomach found at operation. There were none of the intermissions, common in ulcer cases. Occult blood in the

stools was not noted. The X-ray is a valuable diagnostic aid.

A case of congenital atresia of the duodenum was observed by Ernst (Brit. Med. Jour., May 6, 1916) in a child 1 year old. From the first it always vomited after suckling. Two or 3 hours after suckling it began to vomit with almost explosive violence. Very little urine was passed, and the motions were limited to a small amount of typical meconium. The child, given castor oil and enemas, lost weight rapidly. The operation revealed that the intestine at the duodenojejunal flexure, had collapsed to the caliber of an ordinary pencil. He made a duodenoentero-anterior anastomosis, and the child made a complete recovery.

Duotal, see Guaiacol Carbonate, v. 143
Dust cold, see Hyperesthetic Rhinitis v. 600; also this Index.
Dupuytren's contracture, viii. 510; see also Contractures, Dupuytren's, this Index.
Dwarfs, achondroplasic, i. 720

Magnus (Norsk Mag. f. Laegevid., Jan., 1917) observed a female dwarf, 22 years old, who tolerated 100 Gm. levulose for a weight of only 37 Kg. This and the small sella turcica suggested the dwarfism was the result of defective development of the hypophysis. The growth was apparently normal till the age of 9, when chronic bronchitis became installed.

Dynamic squint, see Strabismus, viii. 401
Dysentery, iv. 347
- alcohol in, i. 525
- aluminum acetate in, i. 587
- betanaphthol in, ii. 465
- blood-pressure in, ii. 498
- borax in, ii. 588
- calumba in, ii. 722
- cannabis indica in, iii. 8
- castor oil in, iii. 16
- collargol in, iii. 535
- creolin in, iii. 690
- creosote in, iii. 688
- ergot in, iv. 572
- Hope's mixture in, vii. 45
- ipecac in, viii. 836
- krameria in, vi. 237

Dysentery (*continued*).
- lead acetate in, vi. 313
- lime water in, ii. 720
- mercury bichloride enemata in, vi. 679
- morphine in, vii. 188
- naphthalene in, vi. 785
- opium in, vi. 313; vii. 188, 190; viii. 836
- pomegranate in, vii. 331
- protargol in, viii. 136
- salicylic acid in, viii. 59
- sodium nitrate in, viii. 189
- sodium phenolsulphonate in, vii. 447
- sodium sulphate in, viii. 186
- starch enema in, vi. 313
- zinc sulphate in, viii. 836

acute, cinnamon in, iii. 396
- magnesium sulphate in, vi. 474
- opium tincture in, vi. 474
- pancreatin in, vii. 298
- silver nitrate injections in, viii. 136
- sulphuric acid (aromatic) in, vi. 474

amebic, iv. 366

Ronald Ross (Lancet, Jan. 1, 1916) refers to the fact that the many cases in troops from Britain, Australia, and New Zealand in the present war are men who have never had amebic dysentery before. Many of the cases succumb before reaching the base hospital, and those that survive have frequently reached the condition of "running dysentery," which always suggests that a large proportion of the mucosa is already destroyed. But among the Indian troops who are exposed to amebic dysentery from childhood there was not nearly the same frequency of severe cases.

Symptoms, iv. 366.—Leon Giroux (Paris méd., Jan. 1, 1916) treated 172 cases and emphasizes the value of a urinary crisis with *free discharge of chlorides associated with bradycardia* as a sign of convalescence.

Carriers.—Amebic dysentery is shown to have spread considerably in France since the beginning of the war, according to Orticoni and Ameuille (Bull. de l'Acad. de méd., Apr. 4, 1916). Within 5 months there were admitted into a single hospital 28 cases of dysentery—17 bacillary and 11 amebic. Only 3 of these 11 patients had ever left France. In many instances the infection was evidently acquired merely by occupying trenches or encampments previously used by African troops.

In the region of Charleston, where amebic dysentery is more or less prevalent, K. M. Lynch (Jour. Amer. Med. Assoc., Dec. 25, 1915) found that rats were infected with amebas which were indistinguishable from the *Endamœba histolytica.* It is well known that rats feed readily on human fecal material.

Prophylaxis.—Müller (Münch. med. Woch., Jan. 2, 1917) found 165 carriers of typhoid, paratyphoid or dysentery among the 20,019 men examined in about two months. He urges re-examination at intervals of all the men who have anything to do with the preparation or handling of the food. An indigestible meal, or exposure to cold and wet, is liable to bring on the disease in a previously healthy carrier.

H. H. Dale (Lancet, July 29, 1916) found repeatedly that the usual hypodermic emetine therapy of carriers produced but a temporary disappearance of cysts from the stools. The **double iodide of emetine and bismuth** is a salt from which the emetine is liberated only after reaching the alkaline intestinal fluids and 3 grains 0.2 Gm.) contain 1 grain (0.065 Gm.) of emetine, and are equivalent to 60 grains (4 Gm.) of ipecac. It produced striking results. In the majority of cases the cysts were promptly and permanently removed.

As a result of a comprehensive study, C. Dobell (Editorial, Brit. Med. Jour., Jan. 27, 1917) concludes that the proportion of individuals still infected with *E. histolytica* among the convalescents from intestinal disorders reaching England from the Mediterranean area has been about 18 to 25 per cent. Evidence as to the **double iodide of emetine and bismuth** encourages the hope that rapid cure of most cases will result. Not less than 36 to 40 grains (2.4 to 2.6 Gm.) in daily doses of 3 or 4 grains (0.2 to 0.26 Gm.) must be given; even more may be necessary in individual cases. The drug may exceptionally succeed in removing an infection with *E. coli.*

appendicostomy in, iv. 379, 380
argyrol in, iv. 377
bismuth subnitrate in, iv. 377
calomel in, iv. 377
castor oil in, iv. 377
cataplasms in, iv. 376

Treatment, iv. 376.—P. I. Nixon (Jour. Amer. Med. Assoc., Mar. 25, 1916) records excellent results from the daily administration of 4 glasses of fresh infusion of **chaparro amargosa**, and rectal injection of a quart (liter). He has had little need for emetine on account of the results obtained. The supply of chaparro amargosa is unlimited.

cocaine in, iii. 481
copper sulphate in, iv. 377
diet in, iv. 376, 377, 378
emetine in, iv. 379, 448; vi. 60, 61

J. G. and D. Thomson (Brit. Med. Jour., June 24, 1916) advise that all cases of suspected dysentery receive at once 1 grain (0.06 Gm.) of **emetine** daily at the advanced dressing station, to be continued during the transit toward the base until at least 7 grains (0.45 Gm.) have been given.

A series of cases has convinced Low (Lancet, Mar. 31, 1917) that emetine given by the mouth, as **emetine bismuth iodide**, is apparently as efficient as emetine by the needle in amebiasis with liver involvement.

enema of ice-water in, iv. 379
enemata in, iv. 378, 379
eucalyptol in, iv. 379, 380

Moszkowski (Berl. klin. Woch., Jan. 31, 1916) has employed with marked success the method of de Haan and K. de Jonge in the Dutch East Indies. An emulsion of 80 Gm. (2⅔ ounces) **iodoform** with 100 Gm. (3⅓ ounces) gum acacia in 180 c.c. (6 ounces) distilled water is given by **rectal injection**. A soft tube is introduced into the intestine for 50 cm. Then 45 or 55 c.c. (1½ to 3⅚ ounces) of the emulsion are forced into the tube with a syringe. His 13 patients bore the injection well, and retained the fluid for 2 or 3 hours. From 1 to 3 enemas are necessary. These injections are given daily in all cases of bloody diarrhea regardless of dysentery, typhoid or other cause.

hydrogen dioxide in, iv. 379, 380
ipecacuanha in, iv. 378; vi. 60
irrigation of the colon in, iv. 380
laudanum in, iv. 376
magnesium sulphate in, iv. 377
morphine in, iv. 376
potassium permanganate in, iv. 377
protargol in, iv. 377
quinine lavage in, iii. 392; iv. 379, 380
quinine sulphate in, iv. 377
saline irrigations in, iv. 377, 380

Emetine having been tried in a large number of soldiers, Ravaut and Krolunitski (Bull. et mém. de la soc. méd. des Hôp. de Paris, Oct. 21, 1915) tried **salvarsan** intravenously at 6-day intervals in doses of 0.45 Gm. (7 grains), later increased. In the intervals an enema of 6 ounces (200 c.c.) of normal saline solution containing 15 drops of tincture of opium and 0.45 to 0.6 Gm. (7 to 10 grains) of arsenobenzol was given. Where the bowel movements were not very copious, these enemas were well borne, remaining in some patients more than 24 hours. Excellent results were obtained.

Milian (Paris méd., Nov. 27, 1915) also reported that he had used **arsenobenzol** with success.

silver nitrate in, iv. 377
starch water in, iv. 376
stupes in, iv. 376
succinic peroxide acid in, iv. 377
sulphur in, viii. 429
tannic acid in, iv. 377
thymol in, iv. 377
tonics in, iv. 378
bacillary, iv. 348

Prophylaxis.—Hever and Lucksch (Wiener klin. Woch., Oct. 21, 1915) described an epidemic in a small town in which a mortality of 19.4 per cent. occurred in the 67 cases, all in about 8 months. All the sick were sent to a special hospital, and search was made for carriers in the infected houses. After this all the adults left were inoculated with a **polyvalent vaccine**, a total of 342 persons out of a population of 800. About 243 were inoculated twice. The reaction was always mild. The epidemic was promply arrested.

Castellani (Brit. Med. Jour., Feb. 26, 1916) deems dysentery **vaccination** of great importance practically. Since 1912, he has prepared a mixed dysentery vaccine, and also a vaccine containing the mixed vaccine plus typhoid, paratyphoid A, paratyphoid B. Dysentery vaccine of this type should be prepared with a carbolic salt emulsion from agar cultures without heating, or peptone water cultures. Many strains of Shiga-Kruse bacillus should be inoculated in rabbits, and the least virulent, provided it be rich in antigen, should be kept permanently as a stock culture to prepare the vaccine. Broth cultures should never be used.

T. J. Carey Evans (Brit. Med. Jour., Mar. 31, 1917) lends support to the belief that flies are the usual means of extension and urges proper disposal of the human dejecta, combined with adequate screening.

Treatment.—Gröer (Münch. med. Woch., Apr. 6, 1915) noted that **adrenalin** by the mouth quieted the abdominal pain and tenesmus of bacillary dysentery. When given every 1 or 2 hours it is possible to keep the patients entirely free from pain. In an experience with 300 cases he found that even enormous amounts were borne without appreciable by-effects. Addition of adrenalin to tepid saline for flushing the bowel had a remarkably favorable action.

ammonia (aromatic spirit) in, iv. 360
bacterins in, iv. 364
bismuth in, iv. 361
boric acid solution in, iv. 362
brandy and milk in, iv. 360
calomel in, iv. 360
castor oil in, iv. 360
chloroform in, iv. 360
cocaine suppository in, iv. 361, 362
diet in, iv. 360, 363
emetine in, iv. 361

Dysentery, bacillary (*continued*).
  enemata in, iv. 360, 361, 362
  flannel binder in, iv. 360
  Glauber's salt in, iv. 360
  Hoffman's anodyne in, iv. 360
  Holarrhenœna antidysenterica in, iv. 362
  hot applications to abdomen in, iv. 360
  hypodermoclysis in, iv. 360
  ipecacuanha in, iv. 361
  laudanum in, iv. 361
  magnesium sulphate in, iv. 362
  massage of abdomen in, iv. 362
  mercury bichloride in, iv. 361
  morphine in, iv. 361
  mustard plaster in, iv. 361
  nux vomica in, vii. 146
  opium suppository in, iv. 361, 362
  paregoric in, iv. 361
  polyvalent serum in, iv. 363
  quinine bimuriate with urea enema in, iv. 362
  Rochelle salt in, iv. 360
  salicylic acid in, iv. 362
  saline cathartics in, iv. 360, 361
  salt solution enema in, iv. 362
  sea voyage in, iv. 362
  serum therapy in, iv. 363

R. Kraus (Wiener klin. Woch., Apr. 1, 1915) states that serum has given better results than in any other infection. The mortality is reduced about 50 per cent., and the influence on the disease seen very promptly.

  silver nitrate in, iv. 362
  sodium carbonate in, iv. 362
  starch-water enema in, iv. 361
  tonics in, iv. 362
  vaccine in, iv. 365

The not infrequent serious consequences resulting from the use of dysentery vaccines led Leonard Rogers (Brit. Med. Jour., Jan. 1, 1916) to try the effects of sensitized vaccines. The vaccines were stock ones of Shiga or Flexner strains sensitized with the Lister Institute antidysenteric serum. The single doses of these vaccines never exceeded 100 million. In most cases the results were very satisfactory.

  wine whey in, iv. 360
 chronic, iv. 350
  alum in, i. 585

Dysentery, chronic (*continued*).
  appendicostomy in, iv. 365, 366
  arnica in, ii. 118
  bismuth in, iv. 365, 366
  colonic irrigations in, iv. 365
  creosote in, iv. 365
  gum arabic in, iv. 365
  iodoform in, iv. 365
  ipecac in, iv. 365
  olive oil in, vii. 171
  opium in, iv. 365
  peppermint in, iv. 365
  silver nitrate injections in, viii. 136
 hemorrhage in, v. 161
  hydrastis in, v. 546
 infantile, vaccine prophylaxis in, ii. 422. See also Ileocolitis, Acute, iv. 999; also this Index.
 pseudo-, protargol in, viii. 136
 ulcerations in, iodine and iodides in, vi. 44
Dysidrosis, see Pompholyx, vii. 567
Dysmenorrhea, iv. 380
  acetylsalicylic acid in, ii. 220, 221; viii. 56
  aconite in, i. 285; iv. 391
  Aix water in, iv. 390
  ammonium acetate in, iv. 389
  amyl valerate in, i. 624
  antipyrin in, ii. 44; iv. 388, 389
  atropine in, ii. 449; iv. 388, 389

Atropine diminishes the irritability of the autonomic nerve endings in the uterus. Its use in E. Novak's (Jour. Amer. Med. Assoc., Jan. 9, 1915) experience has been most encouraging; he follows the plan of Novak, of Vienna. Beginning just before menstruation he gives three times a day a pill containing 0.5 mg. (1/120 grain). In general, patients who respond most favorably are those in whom the atropine has been pushed to the point of tolerance.

  baths in, iv. 388, 390; viii. 812
  belladonna in, iv. 388, 389
  Bier's hyperemia in, v. 597
  boneset in, iv. 388
  bromides in, iv. 391
  camphor in, ii. 732
  cannabis indica in, iii. 7; iv. 388
  capsicum in, iv. 388
  chamomile in, iv. 388
  change of residence in, iv. 390

Dysmenorrhea (*continued*).
  childbearing in, iv. 391
  chloroform in, iv. 388
  cimicifuga in, iii. 345
  cocaine to nasal mucosa in, iv. 396
  corpus luteum in, i. 790

Leighton (Amer. Jour. of Obstet., Nov., 1915) is convinced that there are cases of dysmenorrhea in which the main causal factor is deficient action of the natural corpus luteum. The drawbacks to the use of **corpus luteum** are that it generally has to be used routinely or continuously to obtain and to maintain results. From 15 to 20 grains a day, seldom more, is sufficient in any case.

  cotarnine hydrochloride in, iii. 675
  cotarnine phthalate in, iii. 676
  curettage in, iv. 385, 395, 396
  diet in, iv. 391
  dilatation in, iv. 385, 396, 397
  electricity in, iv. 390
  ether (nitrous) spirit in, iv. 388
  exercise in, iv. 391
  flaxseed in, iv. 388
  ginger in, iv. 388
  graduated sounds in, iv. 397
  guaiac in, v. 143
  hot baths in, iv. 388
  hot mustard foot-baths in, iv. 390
  hot salt baths in, iv. 390
  hydrastis canadensis in, iv. 389; v. 546
  hyoscyamus in, iv. 388, 389, 391
  iron in, iv. 390
  laxatives in, iv. 391
  leeches in, iv. 397
  magnesium sulphate in, iv. 389
  manganese (black oxide) in, iv. 389
  marriage in, iv. 392
  medicated waters in, iv. 390
  methylene blue in, vi. 68
  morphine in, iv. 388
  mud-baths in, iv. 390
  opium in, iv. 388, 389
  ovarian extract in, i. 788; iv. 390
  peppermint in, iv. 388
  potassium bicarbonate in, iv. 388
  potassium bromide in, iv. 388
  Pozzi operation in, iv. 393
  pulsatilla in, iv. 390
  puncture of cervix in, iv. 397
  quinine in, iii. 390
  sacral anesthesia in, viii. 217

Dysmenorrhea (*continued*).
  saffron in, iv. 389
  scarification of cervix in, iv. 397
  scutellarium in, iv. 388
  sodium cacodylate in, ii. 704
  suction cup in, iv. 394
  surgical treatment of, iv. 392
  Teplitz water in, iv. 390
  theobromine in, iv. 388
  thyroid substance in, iv. 389, 390
  valerian in, viii. 781
  viburnum prunifolium in, iv. 389
  warm hip-baths in, iv. 390
  Wylie's drain in, iv. 385
  zinc valerate in, iv. 389
 anemic, iron in, vi. 85
 congestive, apiol in, ii. 59
 functional, tansy, oil of, in, viii. 499
 membranous, manganese dioxide, vi. 573
Dyspepsia, viii. 330, see also Stomach, Disorders of, this Index.

Appendicitis and cholecystitis were responsible for approximately 35 per cent. of 1000 cases of chronic or recurring indigestion studied by Vanderhoof and Hutcheson (Bull. Johns Hopkins Hosp., May, 1915); peptic ulcer and neuroses, each 10 per cent., and carcinoma involving the stomach or bowels, 5 per cent. Ten per cent. of the cases fall into a group including chronic gastritis, visceroptosis, peritoneal adhesions, enterospasm and enterogenous toxemia; while 25 per cent. are included in a group in which the indigestion is a reflex disturbance from affections of the kidneys, lungs, heart, eyes, blood and ductless glands, ears, central nervous system, female pelvic organs, and migraine and chronic infections.

  acetic acid in, i. 231
  arsenical waters in, vi. 712
  asafetida in, ii. 190
  bismuth in, ii. 473
  camphor in, ii. 731
  cannabis indica in, iii. 8
  climatic treatment in, vi. 716
  creosote in, iii. 688
  lactic acid in, vi. 242
  magnesium oxide in, viii. 186
  nitric acid in, vii. 45
  phosphoric acid in, vii. 450
  potassium cobaltonitrite in, vii. 585

Dyspepsia (*continued*).
  quassia in, vii. 721
  resorcin in, vii. 808
  sodium bicarbonate in, viii. 186
  sodium citrate in, viii. 187
  sodium phenolsulphonate in, vii. 447
  thiocol in, viii. 528
  zinc sulphate in, viii. 836
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  saccharin in, viii. 45
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  berberine in, v. 546
  buchu in, ii. 694
  calumba in, ii. 722
  capsicum in, iii. 15
  chirata in, iii. 199
  cinchona, compound tincture of, in, viii. 117
  eucalyptus in, iv. 705
  gentian in, v. 19
  ginger in, viii. 837
  hydrastis in, v. 546
  hydrochloric acid in, v. 555
  iron waters in, vi. 712
  nux vomica in, vii. 148
  pepsin in, vii. 362
  potassium bicarbonate in, vii. 577
  rhubarb in, viii. 30
  serpentaria in, viii. 117
  taraxacum in, viii. 503
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  anesthesin in, i. 664
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  bismuth in, ii. 472
  bran gems in, viii. 340
  bromides in, viii. 340
  butter in, viii. 340
  cascara in, viii. 340
  change of climate in, viii. 339
  coca, fluidextract of, in, viii. 340
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  electricity in, viii. 339
  enemas in, viii. 340
  ferruginous waters in, viii. 340
  food, abundant, in, viii. 339
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  gentian, elixir of, in, viii. 340

Dyspepsia, nervous (*continued*).
  honey in, viii. 340
  hydrochloric acid in, v. 555
  hydrotherapy in, viii. 339
  iron chloride, tincture of, in, viii. 340
  massage in, viii. 339
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  olive oil in, viii. 340
  outdoor exercise in, viii. 339
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  cactus grandiflorus in, ii. 708
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  opium in, vii. 188
  oxygen inhalations in, vi. 246; vii. 274
  quebracho in, vii. 721
  strychnine in, vii. 146
  tracheotomy (early), vi. 250
 bronchitic, grindelia in, v. 142
 cardiac, morphine in, vii. 190

Dyspnea with slight cyanosis seen in elderly patients subjects of cardiac disease is due, not to an excess of carbon dioxide brought about by insufficient aeration of the blood, but to an acid intoxication, according to T. F. Cotton (Can. Med. Assoc. Jour., Nov., 1915). This dyspnea often is of the Cheyne-Stokes type, and is accompanied by various signs of cardiac failure; hypertension is common, renal impairment is constant, and wasting and a subnormal temperature are to be noted. There is probably no real difference between cardiac and renal asthma, and the dyspnea probably is due to renal insufficiency.

  nitrites in, vii. 54
  oxygen inhalations in, vii. 274
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Dyspnea (*continued*).
  paroxysmal edematous, nitroglycerin in, vii. 54
  pulmonary, oxygen in, vii. 274
Dystrophy, muscular, vi. 756
Dysuria, erigeron in, iv. 572
    uva ursi in, viii. 763
  spasmodic, gelsemium in, v. 18

Eagle spirits, see Methyl Alcohol Poisoning, vi. 683
Ear, abscesses of, iv. 712
  clefts of, plastic surgery for, viii. 444
  cysts of, iv. 712
  eczematous inflammation of, iv. 712
    bismuth in, iv. 713
    cade oil in, iv. 713
    calomel in, iv. 713
    diaphtherin in, vii. 446
    hydrogen dioxide in, iv. 713
    ichthyol in, iv. 713
    iron chloride in, iv. 713
    mercury (yellow oxide) in, iv. 713
    silver nitrate in, iv. 713
  enlarged, plastic surgery for, viii. 444
  external, diseases of, iv. 711
  fibroma of, iv. 712
  fistula of, congenital, iv. 711
  foreign bodies in, iv. 718

Milton Goldsmith (Jour. Amer. Med. Assoc., Feb. 17, 1917) gives the histories of 4 cases of gastric disorders due to the presence of a foreign body or impacted cerumen in the auditory canal. In each case its removal relieved the symptoms. These were produced by the irritation of the nerve of Arnold, a branch of the vagus.

    agglutination method in, iv. 719
    air-douche in, iv. 719
    carbolated glycerin in iv. 719
    gentle rotary rubbing in, iv. 719
    gravity in, iv. 719
    incision in, iv. 719
    special forceps in, iv. 719
    syringe in, iv. 718
  frost-bite of, iv. 712
  furuncle of, iv. 714

During the preparation of the autogenous vaccine, which takes 2 days, H. Beattie Brown (Annals of Otol., Rhin. and Laryn., Sept., 1914) frequently gives an intitial dose of a pure staphylococcus aureus or albus vaccine, prepared and kept on hand in the laboratory. If the offending organism corresponds to the organism of the vaccine used in the first treatment, and if there has been an improvement, the stock vaccine is continued; in other circumstances the autogenous preparation is substituted.

    alcohol in, iv. 715
    aluminum acetate in, iv. 715
    anesthesin in, iv. 715
    cocaine in, iv. 715
    glycerin in, iv. 715
    heat in, iv. 714
    hydrogen dioxide in, iv. 714
    ichthyol in, iv. 715
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    mercury (yellow oxide) in, iv. 714
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  granulation masses of, iv. 715
    cocaine in, iv. 715
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  hematoma of, iv. 712
  injuries of, iv. 712
  insects in, olive oil in, vii. 171
  internal, disorders of, v. 684
  lobule, adherent, plastic surgery for, viii. 444
    clefts of, plastic surgery for, viii. 444
    elongated, plastic surgery for, viii. 444
    shortened, plastic surgery for, viii. 444
  malformations of, iv. 711
    curetting in, iv. 711
    plastic surgery in, iv. 711
  middle, disorders of, vi. 687
  operations, quinine anesthesia in, iii. 395
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  otomycosis of, iv. 719
    borated alcohol in, iv. 719
    boric acid in, iv. 719
    hydrogen dioxide in, iv. 719
    silver nitrate in, iv. 719
  outstanding, plastic surgery for, viii. 443
    Morris's operation in, iv. 711
  perichondritis of, iv. 712
  suppuration and necrosis, v. 689
      absorbent alteratives in, v. 690
      ampullæ opened in, v. 690
      blood-letting in, v. 690

Ear, suppuration and necrosis (*continued*).
  carious bone removed in, v. 690
  derivatives in, v. 690
  quinine in, v. 690
  rest in bed in, v. 690
  strychnine in, v. 690
  tympanum eviscerated in, v. 690
  vestibule curetted in, v. 690
 shell shock of.

In a study of the effects of high explosives on the ear, the majority observed from 20 hours to 1 week after injury, Wilson (Brit. Med. Jour., May 5, 1917) states that over 200 patients exhibited nerve symptoms. Of these, 50 complained of deafness of varying degree, 17 of these showing demonstrable signs of injury to the internal ear. Elsewhere, deafness in many had been temporary, and no objective signs of disturbance of equilibrium could now be seen. High explosives can produce rupture of the membrana tympani, tending in most cases to spontaneous closure. Concussion of the internal ear, with nerve deafness and equilibrium disturbances, occurs with or without rupture. The concussion may pass off, leaving an injured nerve mechanism demonstrable by (*a*) nerve deafness of a varying degree; (*b*) defect of equilibrium. In recently perforated membrane, the most satisfactory measure is to leave the blood clot over the perforation intact. All the cases ought to be kept in bed 10 days.

Wicart (Bull. de l'Acad. de méd., Sept. 19, 1916) advises to fill the ear with cotton wet with glycerine to prevent contusion of the tympanic membrane, and to wear ear muffs padded with cotton. Swallowing 2 or 3 times, with the nostrils pinched together with the fingers, helps to hold the tubes open at the moment of the explosion. He holds that about 95 per cent. of the cases of deafness can be relieved. With time for thorough attention, only 1 to 2 per cent. of cases need be dismissed from military service for this cause. Deafness due to labyrinth concussion soon disappears upon local and general rest, though if cephalic congestion or general asthenia coexist, these likewise demand remedial measures.

 syphilis of, v. 688
 wounds of, iv. 712
Earache, atropine in, ii. 450
  cocaine in, iii. 482, 487
  guaiacol in, v. 147
Ecchymosis of the conjunctiva, iii. 588
 of the eyelid, see Eyelids, Ecchymosis of, iv. 720; also this Index.
Echinococcic cyst of the orbit, vii. 211
 of spleen, viii. 307, 315
 thyroiditis, chronic, viii. 559
 disease, vii. 327

A comprehensive study of echinococcus disease led Zapelloni (Policlinico, Nov. 15, 1915) to conclude that the positive deviation of complement test of Bordet and Gengou is constant and specific in this affection.

In 16 operative cases of echinococcus disease of the liver Gallart-Monés (Arch. des Mal. de l'Appareil Digestif, ix, No. 3, 1916) obtained a positive reaction with the hemolytic test in only 69 per cent.

  evacuation of cysts in, vii. 329
  incision of cysts in, vii. 329
 infection of pleura, vii. 526
Echinococcus and hematuria, v. 398
Echinorhynchus hominis, see Acanthocephala, vii. 319
Eck's fistula in cirrhosis of liver, iii. 459
Eclampsia, infantile, see Convulsions, Infantile, iii. 616; also this Index.
 nutans, see Automatic Rhythmical Movements, iii. 638; also this Index.
 puerperal, see Puerperal Eclampsia, vii. 706; also this Index.
 rotans, see Automatic Rhythmical Movements, iii. 638; also this Index.
Ectatic aneurism, i. 666
Ecthyma, ichthyol in, v. 639

This disease, according to Kromayer (Deut. med. Woch., May 13, 1915), constitutes 30 per cent. of war dermatoses. Small pustules, scratched open and soiled with dirt, form scabs. After thorough cleansing, potassium permanganate solution 1:4000, silver nitrate 5 per cent. solution, and tincture iodine, are the best agents. The regular dressing should be boric acid ointment or dermatol. If the ulcers prove at all refractory the fine **Paquelin cautery** should be applied.

Warning against the use of wet dressings in this condition, where it affects the limbs, is given by Bodin (Presse méd., Feb. 3, 1916) a French Army surgeon. Crusts having been removed from the ulcerations, these should be touched with a 1 per cent. solution of **silver nitrate**, dried with cotton, then dusted with **thymol iodide** or **subcarbonate** of iron. Around it, a **zinc paste** containing **calomel** should be applied. When superficial repair is slow, the silver nitrate stick may be used, and a **red cinnabar plaster**, extending beyond the ulcer only 1 or 2 mm., applied.

Chastanet (Presse méd., May 11, 1916), in ecthyma on the lower limbs of soldiers, first removes the crusts with sterile moist cotton pledgets, cauterizes the lesion deeply with **silver nitrate**, and applies a sterile wet dressing. Cauterization is continued until the tissues become reddish, when, after a last cauterization, a 1 in 10 tincture of **iodine** is freely applied. The surface is then tamponed with slightly moistened cotton, and a dry sterile compress is applied. If the lesion is not dry the next day, the procedure is repeated.

quinine in, iii. 390

gangrenous, **oxygen** in, vii. 275

Ectopia lentis, iii. 701

Ectopic gestation, vii. 606, see also Abortion, Tubal, i. 184

Experience in 385 cases of ectopic gestation, showed L. J. Ladinski (Trans. Amer. Med. Assoc.; N. Y. Med. Jour., June 23, 1917) that the signs in the unruptured type were amenorrhea or some irregularity of menstruation; a feeling on the part of the patient that she was pregnant; pain which was sharp, lancinating, and paroxysmal in character, not only referring to the affected side, but particularly to the ovarian region; bleeding from the uterus usually beginning about the sixth or seventh week; the presence of a distended tube on one side; enlargement of the uterus, its consistency, however, being that of the non-pregnant organ. The most reliable sign of *uterine pregnancy* was the *elastic area* found *in the median line* of the anterior wall of the uterine body above the cervix. In tubal pregnancy, this area in the anterior wall was never present except where the disintegration of the decidua did not take place before the removal of the gravid tube. In that case there was absence of bleeding, and the decidua was subsequently expelled in the form of a uterine cast.

colpoceliotomy in, vii. 607

ruptured, i. 184

W. Wayne Babcock (Amer. Jour. of Obstet., Aug., 1916) refers to those tragic cases of rupture in extrauterine gestation in which death usually occurs unless hemorrhage is controlled surgically. Such patients suffer shock, through a blood-pressure lowering reflex awakened by the peculiar irritant action of the blood upon the peritoneum. Often the additional shock of an abdominal section determines the patient's death. To avoid this, he recommends in all alarming cases the following procedure, which he employed in 24 instances, with recovery in every case: Under spinal or light ether anesthesia, after introduction of a weighted vaginal speculum, the cervix is pulled downward and forward, and the cul-de-sac of Douglas opened behind the cervix in the midline by thrusting through a pair of sharp pointed scissors toward the posterior uterine wall. The scissors having been opened and withdrawn, the incision is widely enlarged by traction after insertion of both index fingers through it. Two fingers are at once introduced into the cul-de-sac, the diseased tube located, thoroughly isolated, and pulled down into the vagina, along with the ovary, and a clamp applied near the uterus. The tube and ovary distal to the clamp may then be cut away, unless the patient is moribund. A piece of gauze fully occupying the vaginal incision is introduced to isolate clamp from the intestinal coils. The patient can thus be returned to bed in from 3 to 10 minutes, with little or no increase in the pre-existing shock. The clamp is cautiously opened half an inch at the end of 48 hours, rotated 90 degrees in each direction, and removed. The gauze is removed on the fourth or fifth day, and usually need not be replaced.

  intravenous anesthesia in, iv. 688
  Schleich's infiltration in, iii. 497
  spinal anesthesia in, viii. 210
Ectropion, iv. 727
  galvanocautery in, iv. 728
  lid clamp in, iv. 728
  shortening the tarsus in, iv. 728
  Snellen's sutures in, iv. 727
  transplantation of skin in, iv. 727
  Wharton Jones's operation in, iv. 727
 cicatricial, thiosinamine in, viii. 530
Eczema, iv. 397

Etiology, iv. 401.—In an elaborate research on the external origin of eczema, particularly the *occupational eczemas*, based on a study of 4142 cases, F. C. Knowles (Jour. of Cutan. Dis., Jan., 1913) concludes as follows: Fully one-fourth of all cases of eczema are of definite external origin. Almost one-sixth of all cases of this affection are caused by the occupation of the individual. Micro-organisms probably play a secondary rôle. Practically every occupation and every irritant may produce an eczema. The eruption not infrefrequently extends beyond the irritated areas, at times to distant parts. It is hard to explain the susceptibility of some individuals to certain irritants, excepting on the theory of a pure idiosyncrasy, an anaphylactic tendency causing skin sensitization.

In a series of 24 cases of moist eczema studied by C. P. White (Jour. of Cutan. Dis., Feb., 1916) for anaphylactic phenomena, 4 patients gave entirely negative tests; 14 reacted positively to fat-free milk; 9 to egg albumin; 13 to salt-free butter, and 6 to lactose or to oatmeal water. There were 24 cases of red, infiltrated, dry and scaling eczema; of these 5 gave negative tests; 16 reacting positively to fat-free milk; 12 to egg albumin; 16 to salt-free butter, and 7 to lactose or to oatmeal water.

The cutaneous reaction from proteins in eczema was studied by Blackfan (Amer. Jour. Dis. of Children, June, 1916). He inoculated patients with egg white, milk and various other animal and vegetable proteins, both by the cutaneous or scarification method, and the intradermal method. Of 27 with eczema, 22 gave evidence of susceptibility to proteins. If there was a reaction from one protein, there was usually a reaction from several.

Gougerot, according to Sabella (Policlinico, June 8, 1915), has shown that eczema is the expression of a defensive reaction to some poison from within or without, the object of the edema being to dilute the toxic substances. Treatment should aim to reduce the toxins, facilitate their elimination, compensate for deficient internal secretions by **organotherapy**, and in rebellious cases try to wash the blood free of toxins by **venesection** and **saline infusion.**

acacia dressing in, iv. 410
acetanilide in, i. 227; iv. 410
aconite in, i. 285
adrenalin in, i. 774
alcohol in, i. 533
almond oil in, iv. 407
aloes in, iv. 407
aluminum acetate in, iv. 406
alumnol in, i. 591; iv. 408
anesthesin in, i. 664
antimony in, ii. 27
aperient mineral waters in, iv. 406
aristol in, iv. 409
arsenic in, iv. 406
belladonna in, ii. 451
benzoin tincture in, ii. 456
Bier's hyperemia in, v. 599
bismuth subnitrate in, iv. 408
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boric acid in, ii. 585; iv. 408, 410
boric acid salve-mulls in, iv. 408
bromides in, iv. 406

Eczema (*continued*).
cacodylates in, ii. 705
cade (oil of) in, iv. 408, 410, 411
calamine in, iv. 407, 408, 410
calisaya in, iv. 407
calomel in, iv. 406, 408
camphor in, ii. 733; iv. 411
camphor ice in, iv. 410
cannabis indica in, iii. 8
carbolic acid in, iv. 408, 410
carbon-dioxide snow in, vii. 786
cascara sagrada in, iv. 407
castor oil in, iv. 407
chloral hydrate in, iii. 211; iv. 406
cloves (oil of) in, iii. 461
coal-tar in, iv. 408, 409
codliver oil in, iv. 406
colchicum in, iv. 406
cold cream in, iv. 407, 408
copaiba in, iv. 406
diachylon ointment in, iv. 408
diet in, iv. 405, 406

Treatment, iv. 405.—Believing that the sugar must be at fault in the case of a baby, Sturtevant (N. Y. Med. Jour., May 22, 1915) omitted all carbohydrates from the formula. Improvement was immediate, and in six days the face was entirely clear, though the baby had lost about 8 ounces in weight.

Tweddell (Med. Rec., Sept. 11, 1915) agrees with Bulkley that a rice diet, followed by a purely vegetable diet, is the only rational treatment, and that the vesicular form of eczema is due to a diet rich in proteins and stimulants.

electrolytic transmission of sulphur in, viii. 429
exercise in, iv. 406
gelatin dressing in, iv. 409
gelsemium in, v. 18
gentian in, iv. 407
glycerin in, iv. 407, 409, 410
green soap in, iv. 407
high-frequency currents in, iv. 427
hypophosphites in, iv. 406
ichthyol in, iv. 406, 409; v. 638, 639
iodine in, iv. 406
iron in, iv. 406
kaolin in, iv. 407
lead lotion in, iv. 407
lime water in, iv. 407

Eczema (*continued*).
liquor carbonis detergens in, iv. 408
lithium salts in, iv. 406
magnesium sulphate in, vi. 476
manganese in, iv. 406
mercurials in, iv. 406, 408, 410
mercury bichloride in, vi. 680
mercury (yellow oxide) in, iv. 410; vi. 672
methylene blue in, iv. 409
nux vomica in, iv. 406
olive oil in, iv. 407
orchitic extract in, i. 785
outdoor life in, iv. 406
ovarian extract in, i. 788
pancreatin in, iv. 407
papoid in, iv. 407
pepsin in, iv. 407
petrolatum in, iv. 407, 410, 411
petroleum in, vii. 413
phenacetin in, iv. 406
phenosalyl in, vii. 446
picric acid in, iv. 409; vii. 461
plaster-mulls in, iv. 410
potassium acetate in, iv. 406
potassium bicarbonate in, iv. 406; vii. 581
potassium citrate in, iv. 406
potassium dithiocarbonate in, vii. 585
potassium iodide in, iv. 406
potassium sozoiodolate in, vii. 585
potassium sulphide in, viii. 431
quassia in, iv. 407
quinine in, iii. 391; iv. 406
red precipitate in, iv. 408
resorcin in, iv. 408, 410
rhubarb in, iv. 407
salicylic acid in, iv. 408, 410, 411
saline solution in, iv. 407; viii. 192
salines in, iv. 406
salophen in, viii. 70
salt deprivation in, iv. 405
salve-mulls in, iv. 410
silver nitrate in, iv. 406, 410; viii. 139
soap and water in, iv. 407
sodium bicarbonate in, iv. 406
sodium borate in, ii. 588; iv. 406
sodium cacodylate in, ii. 704
sodium carbonate in, viii. 189
sodium salicylate in, iv. 406
starch in, iv. 406, 407
strontium iodide in, viii. 409
sulphonal in, iv. 406
sulphur in, iv. 410, 411; viii. 430
talcum powder in, iv. 406, 407, 410

- Eczema (*continued*).
    - **tar** in, vi. 408, 409; viii. 501
    - **thymol** in, viii. 533
    - **tragacanth dressing** in, iv. 410
    - **trional** in, iv. 406
    - **vegetable bitters** in, iv. 406
    - **white precipitate** in, iv. 408, 410
    - **X-ray** in, viii. 828
    - **zinc carbonate** in, iv. 406, 407
    - **zinc oleopalmitate** in, iv. 407
    - **zinc oxide** in, iv. 407, 408, 409, 410, 411
    - **zinc oxide salve-mulls** in, iv. 408
  - anuria in, **Fischer's solution** in, viii. 190
  - chronic, **alumnol** in, i. 591
    - **arsenic** in, ii. 142, 144
    - **atoxyl** in, ii. 262
    - **boiling water** in, iv. 413
    - **boric ointment** in, iv. 411
    - **cade (oil of)** in, ii. 709
    - **calomel ointment** in, iv. 411
    - **chrysarobin** in, iv. 411, 412
    - **collodion** in, iv. 412
    - **glycerin** in, v. 31
    - **heat** in, iv. 413
    - **high-frequency** in, iv. 412
    - **hot air** in, iv. 413
    - **liquor carbonis detergens** in, iv. 411
    - **medicated rubber plaster** in, iv. 412
    - **mercury** in, iv. 411
    - **mercury (ammoniated)** in, vi. 674
    - **mercury nitrate ointment** in, vi. 674
    - **naphthalene** in, vi. 786
    - **pilocarpine** in, vii. 471
    - **plaster-mulls** in, iv. 412
    - **potassium bicarbonate lotion** in, vii. 581
    - **potassium hydroxide** in, iv. 411, 412
    - **pyrogallol** in, iv. 411, 412
    - **quartz lamp** in, iv. 412
    - **resorcin** in, iv. 411
    - **salicylic acid** in, iv. 411; viii. 58
    - **saline infusion** in, iv. 412
    - **salve-mulls** in, iv. 412
    - **sex gland implantation** in, vii. 360
    - **shampooing** in, iv. 412
    - **silver nitrate** in, iv. 411
    - **simple cerate** in, iv. 411
    - **starch** in, iv. 411
    - **sulphur** in, iv. 411; viii. 430
    - **sulphur waters** in, vi. 709
    - **tar, alkaline solution of,** in, viii. 501
    - **tar ointment** in, iv. 411
    - **thyroid gland** in, i. 733
    - **venesection** in, iv. 412
    - **white precipitate** in, iv. 411
- Eczema, chronic (*continued*).
    - **X-ray** in, iv. 412

The X-ray is regarded as an ideal local remedy for eczema by I. W. Ballard (Med. Rec., Mar. 27, 1915). Rapidly growing cells are many times more susceptible to the rays than normal tissue cells. Pain is relieved to a remarkable extent. The soothing process is accomplished by means of long exposure to a soft tube, and stimulation by short exposure to a hard tube.

    - **zinc** in, iv. 411
  - chronic dry, **lime waters** in, vi. 712
    - of children, **sulphur** in, viii. 501
      - **tar** in, viii. 501
      - **zinc ointment** in, viii. 501
  - erythematous, iv. 397
    - **salicylic acid** in, viii. 58
  - fissured, iv. 399
  - genitalis, **ichthyol** in, v. 638
  - impetiginosum, **ichthyol** in, v. 639
    - **picric acid** in, vii. 461
  - infantile, iv. 400

The eczema in infants and young children, according to C. G. Kerley (Med. Rec., June 17, 1916), may be due to strong soap, mustard, woolen garments, exposure to moist and cold air, excessive perspiration, parasitic disease, discharges from the navel, ears, or nose. Children may tolerate 8, 10, or 12 ounces of milk daily, but when a larger amount is given, eczema results. A gradual increase may establish tolerance. Some infants possess no tolerance whatever for orange juice, which may cause red scaly patches about the mouth and erythema of the cheeks and other parts of the body. Beef juice acts in like manner. Butter fat, milk and cane sugar, and orange juice have been proven by elimination to be the most frequent dietetic cause of eczema. Cow's milk protein is a rare cause. The most stubborn eczema due entirely to external agencies is the eczema intertrigo. Such infants should be taught to evacuate the bowels night and morning. Over the genitals absorbent cotton is placed to collect the urine,

and citrate of potassium given internally. **Unguentum aquæ rosæ** containing white wax, 10 per cent., is effective. The involved areas must be protected from scratching and irritation. In breast-fed infants, the first step should be to examine the mother's milk, and, if a high fat content is found, to reduce it through dieting processes. Such children are rarely cured unless they are weaned. Yet it is not advisable to wean a thriving baby because of eczema. In the bottle fed, the best results are obtained by the use of skimmed milk cooked with starch, preferably rice or wheat. A high protein and a high starch food may be given, often with addition of olive oil to raise the caloric content. As early as the seventh month, squash, carrots, and mashed potato can be added. The salt of fresh vegetables possesses therapeutic value. In children past the bottle age, treatment is along the same lines. Among the drugs, **potassium citrate**, sufficient to neutralize the urine, is the best. Development should not be compromised by unduly rigid dietetic measures. The writer tried **thyroid** extract without much result. In growing children, not babies, with malnutrition and dry scaly skin, he has given 1/15 or 1/20 grain (0.004 to 0.003 Gm.) 2 or 3 times a day.

  carbolic acid in, iv. 413, 414
  glycerin in, iv. 413
  Lassar paste in, iv. 414
  lead subacetate in, iv. 414
  lime water in, iv. 413
  magnesium carbonate in, iv. 413
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  pyrogallol in, vii. 720
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nervous, **ichthyol** in, v. 638
  calcium phosphate in, vii. 450
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of eyelids, see Eyelids, Eczema of, iv. 722; also this Index.
of face, **salicylic acid** in, viii. 58
of nails, vi. 781
of the nose, **diaphtherin** in, vii. 446
of tongue, see Tongue, Eczema of, viii. 566; also this Index.
papular, iv. 398
  phenol in, vii. 443
pruritus of, **sodium bicarbonate** in, viii. 189
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  europhen in, iv. 709
  potassium chlorate in, vii. 583
  salicylic acid in, viii. 58
regional, iv. 400
rubrum, iv. 399
sclerosum, iv. 399
scrotal, **ichthyol** in, v. 638
seborrhœicum, see Pityriasis, vii. 477
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subacute, **liquor carbonis detergens** in, viii. 501
  phenol in, vii. 442
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  tannic acid, glycerite of, in, viii. 498
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  bismuth subnitrate in, ii. 474
vulvar, **aristol** in, ii. 118
  potassium bicarbonate lotion in, vii. 581
weeping or moist, **aluminum borotannate** in, i. 589

The simplest method of treating moist eczema, according to Unna (Berl. klin. Woch., Mar. 22, 1915), is to coat it frequently with a thin layer of a drying paste. The cocci die off under the paste, causing the itching to subside. The paste consists of 10 parts **sulphur lotum**, 10 of **calcium carbonate**, and 80 of **zinc ointment**.

  ichthyol in, v. 638
  iothion in, vi. 39
  lead lotion in, vi. 314
    oxide in, viii. 837
  salicylic acid in, viii. 58
  thyme, oil of, in, viii. 533
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Eczematous inflammation of the auricle, see Ear, Eczematous Inflammation of, iv. 712; also this Index.
  seborrhea, **thyroid gland** in, i. 734
  urethritis, **alkalies** in, viii. 695
    arsenic in, viii. 695
    astringent injections in, viii. 695
    cold water irrigations in, viii. 695
  vulvovaginitis, viii. 768
Edebohl's renal decapsulation, vi. 217
Edema, ii. 190

Edema occurred in the course of infectious disease in a number of cases observed by Jürgens (Berl. klin. Woch., Feb. 28, 1916), in the period of the war. There was also slowly progressive weakness, with slight yellowness of the skin and pallor. Occasionally pains in the legs were observed, as well as scorbutic symptoms and severe intestinal disorders. It was encountered almost exclusively in poorly nourished persons driven to hard work, and was similar to beriberi. Cure followed a more liberal diet in substances known to contain vitamines.

  acupuncture in, i. 347
  apocynum in, ii. 196
  baths in, ii. 196
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  calcium lactate in, ii. 717
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  incision of the legs in, ii. 196
  jalap in, vi. 90
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  Rochelle salt in, ii. 195
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  Southey's tubes in, ii. 196
  sparteine sulphate in, ii. 196
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  theobromine in, ii. 196
  trocar in, ii. 196
  vapor baths in, ii. 196
  warmth in, ii. 196
  acute, **calcium chloride** in, ii. 719
  angioneurotic, ii. 205

J. A. Codd (Brit. Med. Jour., June 16, 1917) obtained excellent results from **adrenalin**, giving 4 minims (0.25 c.c.) of the 1:1000 solution. When given in the first stage of numbness and itching the injection would abort the attack at once. Later he gave **adrenal gland**, 3 times a day. The attacks were diminished in frequency and severity, then ceased.

    nitroglycerin in, ii. 207
    quinine in, iii. 388
    strychnine in, ii. 207
  blue, ii. 206; v. 617
  neonatorum, ii. 207
  of the glottis, see Glottis, Edema of, this Index.
  of heart lesions, **apocynum** in, ii. 61
    calomel in, vi. 677
    potassium acetate in, vii. 578
      bitartrate in, vii. 578
  of the larynx, vi. 260, 264
  of pregnancy, vii. 609
  pulmonary, vi. 453; also Lungs, Edema of, this Index.
  hereditary.

Two cases of persistent hereditary edema of the legs (Milroy's disease) with acute exacerbations are reported by J. Phillips (Cleveland Med. Jour., May, 1914). Hope and French have summarized the characteristic findings as follows: Restriction of edema entirely to the legs; absence of any traceable cause, general or local; strong family predisposition; painlessness of the pale swollen legs (apart from the "acute attacks"); absence of constitutional symptoms; sharpness of limitation of the upper level of the edema; incidence in both sexes; permanence of the edema.

No treatment seems effective, though the swelling may be held in check by **bandaging.** The disease does not shorten life.

paroxysmal.

Salt retention is an important factor in paroxysmal edema, according to W. W. Palmer (Arch. of Internal Med., Feb., 1915). Although the kidneys can take care of 2 to 3 Gm. of sodium chloride daily, any increase in the demand for this salt excretion actually reduces, at least temporarily, their capacity even below this amount. The marked therapeutic value of **reduced salt diet** and free **catharsis** is emphasized.

starvation.

Hunger swelling is the name given by Budzynski and Chelchowski (Jour. of Trop. Med. and Hyg., June 15, 1916) to a form of edema observed in 110 cases in certain towns in Poland from insufficiency of food following German occupation. The salient symptoms were, besides the edema, muscular weakness, intestinal disorders, mental depression, dimness of vision, disappearance of sexual impulses, and alterations in the blood and urine. The edema was sometimes limited to the lower limbs, but more often spread over the whole body, involving the face, and especially the eyelids, sufficiently in some to interfere with vision. It sometimes led to bursting of the skin with serous exudation. The swollen, cold skin was painful when pinched up. The condition lasted 1 or 2 weeks in some, in others months, and sometimes recurred. Eight patients succumbed.

traumatic.

L. Levy (Deut. med. Woch., Aug. 12, 1915) described 3 cases among about 1000 patients treated in the orthopedic department of a military hospital. The X-rays revealed marked atrophy of the bones, but no sign of fracture. He confines the treatment to daily **hot air baths** at 70° C. Later, in 1 case, 18 injections of fibrolysin proved ineffectual.

Effusions, adrenalin in, i. 770
    digitalis in, iv. 157
    gold in, v. 74
    mercurial ointment in, vi. 671
  in joints, iodine in, iii. 676
  pleuritic, see Pleuritic Effusions, iii. 151; also this Index.
  serous, glycerin in, vi. 474
    magnesium sulphate in, vi. 474
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Egyptian chlorosis, see Hook-worm, vii. 310
  ophthalmia, see Conjunctivitis, Granular, iii. 565; also this Index.
Ehler's technique in hernia, v. 473
Ehrlich's myelocyte, v. 381
  test in choluria, iii. 307
  theory of immunity, ii. 279
  triple-staining fluid, v. 379
Einthoven electrocardiograph, v. 320
  galvanometer, electromagnet, and microscope, v. 318, 319
Eiselsberg-Witzel technique in jejunostomy, v. 554
Elastic bandage, Bier's, v. 583
Elaterin, see Elaterium, iv. 414
Elaterium, iv. 414
  poisoning, iv. 414
Elbow, amputation at, vii. 800
  dislocations, in, iv. 318, 321
  fractures of, iv. 771
  injuries of.

In infected gunshot injuries of the shoulder and elbow joints, Swan (Lancet, Apr. 7, 1917) regularly gives an injection of a **mixed polyvalent streptococcus and proteus vaccine,** and the area is carefully roentgenographed for any bony injury and the presence of metal fragments.

Willems (Bull. de l'Acad. de méd., Mar. 20, 1917) advocates treating extravasation of blood in the elbow and knee by **puncture,** followed at once by the **physiologic use** of the knee. Industrial accidents and the war have amply convinced him that systematic immobilization should be definitely discarded.

  miners', viii. 509
  resections of, vii. 791
Electric burns, viii. 171
Electrical chorea, iii. 331
  sterilization, viii. 320

Electrocardiograms, v. 317, 318
  of aortic aneurism, v. 323
  of arteriosclerosis with angina, v. 325
  of mitral insufficiency, v. 324
  of myocardial degeneration, v. 323
  of normal heart, v. 322
  showing irregular pulse, v. 318
Electrocardiograph, v. 307, 320
Electrolysis, iv. 421
Electrotherapeutics, iv. 415
Elephantiasis, iv. 428

The spirochete of syphilis is regarded by A. Ravogli (Lancet-Clinic, June 17, 1916) as one of the most effective organisms in causing elephantiasis of the genitals. The condition described was always the result of an extended tertiary ulcerative process. The possibility was not excluded, however, of a superadded tuberculosis. The syphilitic process, as a whole, tends to induce lymphatic stasis. Internal mercurial or arsenical medication gave no results, but bathing with a **mild solution of mercury bichloride** or **sodium bicarbonate** proved useful in relieving tension, and pads of bichloride gauze in the irritation of friction. For good results, **curetting** must be done until the normal substratum is reached. Dressed with **iodoform gauze** or 1:2000 bichloride gauze, the ulcers then soon heal.

amputation in, iv. 431
  anastomosis of lymphatics in, iv. 432
  angeioplasty in, iv. 431
  change of climate in, iv. 431
  cold applications in, iv. 431
  compression of femoral artery in, iv. 431
  elevation of affected member in, iv. 431
  galvanic current in, iv. 431
  Handley's operation in, iv. 432
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  partial exsection of sciatic nerve in, iv. 431
  pilocarpine in, vii. 471
  quinine in, iv. 431
  removal of fascia in, iv. 432
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  rest in, iv. 431
  rubber bandage in, iv. 431
  salines in, iv. 431
  stretching of sciatic nerve in, iv. 431
  thyroid gland in, i. 735

G. G. Davis (Penna. Med. Jour., Aug., 1915) obtained a marked reduction in size and considerable improvement in locomotion by the use of **thyroid gland** in large doses, 35 to 40 grains (2.3 to 3.3 Gm.), subsequently reduced to 20 grains (1.3 Gm.) per day. This caused a loss in weight of 89 pounds from 410 pounds.

tonics in, iv. 431
  of the penis, vii. 344
  of the scrotum, vii. 344
Elongated ear lobule, **plastic surgery** for, viii. 444
Elongation of the uvula, vii. 436
Emaciation, pancreatic, **pancreatic opotherapy** in, vii. 299
Embolic aneurism, i. 665
Embolism, iv. 439

In a study of embolism due to gunshot injury to the carotid arteries, based on 14 cases, Makins (Lancet, Sept. 23, 1916) states that embolic obstruction of even minor cerebral vessels may produce more serious effects and is more readily recognized than the blocking of vessels supplying small areas of the limb. It is recognized by a systolic arterial bruit, an arteriovenous murmur and purring thrill, a pulsating swelling in the course of the vessel, or secondary hemorrhage demanding surgical intervention.

alcohol in, iv. 445
  arteriotomy in, iv. 442
  aspirin in, iv. 442
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  citric acid in, iv. 445
  cotton bandaging in, iv. 446
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  drainage of thoracic duct in, iv. 439
  early getting up of patient in prophylaxis of, iv. 445
  elastic stockings in, iv. 446
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Embolism (*continued*).
    hypodermoclysis in, iv. 442, 444
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    morphine in, iv. 442, 444
    opening of pulmonary artery in, iv. 443
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    tobacco smoking in, iv. 445
    Trendelenburg's technique in, iv. 443, 444
  air, iv. 440
  and thrombosis of the pulmonary artery iii. 168
  fat, iv. 439

In fat embolism in military surgery, according to Bürger (Med. Klinik, Sept. 5, 1915), prophylaxis is extremely important. The **Esmarch bandage** should be applied in all cases of multiple fractures or single fracture in the severely wounded, especially the elderly and those weakened by disease or alcohol, those that have been run over by a vehicle or thrown from a horse or hurled by an explosion. The severely wounded men should be left where they are. Ample provision for draining the crushed soft tissues is necessary. Prompt diagnosis and opening up of the focus in the bone and tamponing are often helpful. **Venesection** also relieves the heart and tends to prevent dissemination. **Calomel** may prove useful. If symptoms of pressure of the brain develop, **leeches** to the mastoid may divert the fluid. After recovery from fat embolism one may expect general weakness, dizziness, ready fatigue, etc.

Referring to fat embolism in bone surgery, E. W. Ryerson (Jour. Amer. Med. Assoc., Aug. 26, 1916) advises a complete stoppage of the circulation during and for a short time after the operation. The tourniquet can be left on for ½ hour at a time.

The diagnosis of traumatic fat embolism is usually based, according to Tanton (Jour. de Chir., Mar., 1914), on dyspnea, rise in temperature, brain disturbances and lipuria; but these symptoms are seldom all present. A retarded pulse with accelerated respiration speak strongly for fat embolism (Roux). Purplish spots on the skin of the shoulders, chest, abdomen or front of the thighs were noted by Benestad in 5 cases following fracture; by others on the mucosa and conjunctiva. In the lungs fat embolism may be mistaken for pneumonia, and in the brain for shock or pressure from hemorrhage. The symptoms are seldom fulminating; as a rule in the fatal cases death does not occur for 5 or 6 hours, or days may elapse. Fat embolism may not develop until some time after the fracture—2 weeks in Groubé's case.

  mesenteric, see Intestinal Infarction, v 734; also this Index.
  of the central retinal artery, vii. 205
  of pregnancy, vii. 605
  pulmonary, vi. 450
  retrogressive, vi. 404
  septic, iv. 439
Emery's modification of Wassermann test v. 387
Emetine, iv. 448; vi. 55, 57, 58, 60, 61

Physiological action, iv. 446.—Experimentally R. Moulinier (Jour. de méd. de Bordeaux, Feb. 15, 1914) found that emetine hydrochloride in toxic amounts is capable of causing disturbances of the cardiac contractions and ultimately arrest in diastole. Disordered excitability and contractility were noticed.

Maurel (Bull. de l'Acad. de Méd., Mar. 24, 1914) found that emetine acts electively on the smooth fibers, particularly those in the blood-vessels, causing them to contract. This explains its influence on hemorrhage. In all local congestions it aids in restoring normal conditions, especially in bronchitis, pneumonia, emphysema, etc.

Several instances in which the prolonged use of emetine in apparently harmless doses led to toxic symptoms are cited by H. H. Dale (Brit. Med. Jour., Dec. 18, 1915). In cats and rabbits repeated administration of subtoxic doses invariably led to cumulation with diarrhea, lethargy, somnolence, and even coma. Postmortem the animals showed intestinal irritation with lesions in the kidneys and liver. Use of emetine beyond absolute needs is unwise.

In entamebiasis, according to Lyons (Amer. Jour. Med. Sci., July, 1915) emetine acts only through the circulation, and can influence only entamebas in the tissues. When given by mouth, even, it failed to attack amebas in the lumen of the gut. Relapses are due to survival of entamebas through encystment in the walls of the intestine.

Untoward effects, iv. 447.—In a case reported by Levy and Rowntree (Arch. of Internal Med., Mar., 1916) a man suffering from amebic dysentery and lues received 29 grains (1.8 Gm.) of emetine subcutaneously in 20 days. After slight amelioration this was followed by violent diarrhea, abdominal pain, increasing albuminuria, acute renal insufficiency, acidosis, bronchopneumonia, vasomotor collapse, and death. A woman with pyorrhea alveolaris, receiving four ½-grain (0.03 Gm.) injections on successive days, acquired a distressing diarrhea lasting 6 days, with pain in the back and abdomen and tenesmus. The toxicity of the various commercial preparations of emetine varies widely, and patients differ markedly in their susceptibility to the drug. It should preferably be given subcutaneously and in courses at intervals of several days or a week. In amebic infections, ⅓ grain (0.02 Gm.) 3 times a day for a week or 10 days is usually a safe dose.

Johnson and Murphy (Military Surgeon, Jan., 1917) found in the treatment of 142 cases of endamebic dysentery that emetine hydrochloride can produce toxic effects somewhat analogous to those of salvarsan in syphilis. In the 2 fatal cases there was (1) inability to swallow after food had reached the esophagus, (2) hepatization of the lungs, and (3) rapid and uncontrolled action of the heart. Both patients showed, at first, a general motor weakness, with a tendency for the head to fall forward. One case showed decided cardiac signs. These cases had received in all 23½ and 25 grains (1.52 to 1.62 Gm.). In 5 other cases similar untoward symptoms disappeared promptly upon withdrawal.

Administration, iv. 447.—In *pregnant and menstruating women* ½ grain (0.03 Gm.) daily dose of emetine is the maximum, according to Chalmers and Papatheodorou (Jour. of Trop. Med. and Hygiene, July 15, 1915), which can be given safely. Even the effect of these should be carefully watched, and no more injected than is required to kill the amebas in the stools, all question of a complete cure being set aside until after delivery. It appears advisable not to give emetine during menstruation.

The use of emetine in *bronchial* and *pulmonary affections of infants* and children has been advocated by Guinon and Gouzin (Soc. méd. des Hôp., July 5, 1915). The daily dose in infants was 0.005 Gm. (1/12 grain); in children up to 5 years it was 0.01 Gm. (⅙ grain), and in children over 5 years it was 0.02 Gm. (⅓ grain). If the polypnea and cyanosis indicate a danger of bronchial asphyxia the authors use in addition subcutaneous injections of oxygen, 200 to 500 c.c. (6⅔ to 16⅔ ounces).

Emmet's operation, vii. 648
Emotional and psychic weakness, **nickel sulphate** in, vii. 43
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    oxygen inhalations in, vii. 274
    physostigma in, vii. 459
    resorcin in, vii. 809
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  calomel in, iv. 466
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  cascara in, iv. 466
  change of climate or occupation in, iv. 462
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  cocaine hydrochloride in, iv. 466
  codliver oil in, iii. 513
  compressed-air baths in, iv. 463
  constricting band to limbs in, iv. 464
  counterirritation in, iv. 466
  cupping in, iv. 466
  digitalis in, iv. 467
  elastic shirt or corset in, iv. 465

Good results were obtained by C. J. Macalister (Liverpool Medico-Chir. Jour., Jan., 1914) from the application of elastic webbing around the chest in pronounced cases. In a child whose chest expansion was reduced to ¾ of an inch, rest for a couple of months, with the cotton webbing, brought about complete restoration of respiratory function, the expansion increasing to 2½ inches. Similar results were obtained in others, including adults.

  electric-light baths in, iv. 466
  exercises in, iv. 464, 465
  Freund's operation in, iv. 467
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  saline solution in, iv. 469
  squill in, iv. 469
  tolu in, iv. 469
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An instance of orbitopalpebral emphysema caused by perforation of a dental canal is reported by Aaron Brav (Jour. Amer. Med. Assoc., Oct. 9, 1915). Ordinarily this not very common condition is a result of the fracture of the nasal, lacrimal or ethmoidal bones. The diagnosis is based on sudden swelling of the lid and adjacent tissues, with no signs of inflammation. The swelling does not pit on pressure and there is no exophthalmos.

 vesicular, iv. 453
Empyema, vii. 507

Diagnosis, vii. 508.—Some puzzling features are enumerated by J. H. Pryor (N. Y. Med. Jour., Jan. 1, 1916). It is too frequently overlooked in the child. The signs are practically always different in quality and degree from those of the opposite side. Change of position will indicate altered levels of fluid. Recurrent empyema and undetected pockets of pus occur during childhood as well as in adult life.

Fluoroscopy far exceeds in value, according to Percy Brown (Boston Med. and Surg. Jour., Nov. 25, 1915), radiography in acute or subacute pleural disorders, but the latter is preferable in subacute or chronic cases, or when the varying dispositions of effusion, adhesions and empyema are to be observed.

Etiology, vii. 508.—A study of 299 cases of *acute* empyema of the thorax occurring in the last 10 years at Mt. Sinai Hospital by A. O. Wilensky

(Surg., Gynec. and Obstet., May, 1915) showed the average mortality was 28 per cent., varying from 50 per cent. in infants to 18 per cent. in adults. Children between 3 and 10 years of age showed the lowest mortality. Of the patients who recovered, 23 per cent. had more or less trouble with wound healing.

Treatment, vii. 510.—Under routine methods of treatment, according to Lilienthal and Ware (N. Y. State Jour. of Med., July, 1916) mortality remains nearly constant. Greater individualization insures a marked reduction in mortality. Where the patient is extremely ill, a **simple thoracotomy**, between two ribs, with insertion of a **drainage tube** is indicated as initial operation. Later, when conditions are favorable, the chest is opened by division of the intercostal muscles and by retraction of the ribs to expose the greater part of the pleural cavity. The incision of the thickened pleura to liberate the lung often discloses unsuspected pus pockets, which are also evacuated, and with the X-ray other pockets are located, and all are opened. The wound is closed, room for drainage alone being left. Under such treatment many cases are cured without secondary sinking in of the chest wall. The general mortality is also greatly lowered.

Edward Martin (N. Y. Med. Jour., Oct. 30, 1915), to avoid infection from the skin, punctures the latter, deep fascia, and the muscle with a cataract knife. The trocar is then pushed into the pleural-cavity, stopping when resistance of the chest wall is no longer felt. The location of the pus thus having been determined, an incision 1½ inch long is made through the skin, and a large trocar thrust into the pus cavity. The stylet is removed and a silver tube passed through the cannula. The cannula is then withdrawn, and the flanges of a tube are stitched to the skin by means of a silver wire.

G. Nilson (Nord. med. Ark., Kirurgi, Part 1, No. 5, 1916) deems it established that in children empyemas not uncommonly heal after thoracentesis alone. Of 465 cases of acute pneumonia there were 32 cases of empyema, or 6.8 per cent. The best results were obtained by resecting that rib which in the sitting or half-sitting position of the patient corresponds to the lowest point of the pleural cavity. A piece about 10 or 12 cm. was resected in all his 27 cured cases.

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artificial pneumothorax in, vii. 515
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A. P. C. Ashhurst (So. Cal. Pract., Feb., 1917) disapproves refusal to operate when the needle fails to reveal pus at the time set for operation if pus has previously been found.

bacterial vaccines in, ii. 332, 368
bismuth paste in, ii. 474, 475
blistering in, vii. 510
blood-picture in, v. 384
boric acid in, vii. 513, 515
calisthenic exercises in, vii. 513
camphor in, vii. 510
castor oil in, vii. 510
cauterization in, vii. 515
cocaine anesthesia in, iii. 496
decortication of the lung in, iii. 189; vii. 514
Delorme's operation in, vii. 514
drainage in, vii. 510, 511, 515

To insure free escape for empyema fluid without ingress of air and collapse of the lung, J. Ransohoff (Jour. Amer. Med. Assoc., Apr. 15, 1916) suggests that a stiff, heavy walled **drainage tube** be prepared for insertion into the chest opening, where it must be fitted air tight. Over the free end is slipped a short length of very thin walled collapsible tubing, its free end extending a short way beyond the outer end of the thick tube. During inspiration the opening into the chest is closed by the walls of the collapsible tube falling together and acting like a valve.

Estländer's operation in, vii. 513
ether in, iv. 639
excision of ribs in, vii. 515

Empyema (*continued*).
  formaldehyde injections in, vii. 510
  Fowler's operation in, vii. 514
  glycerin in, vii. 510
  incision in, vii. 515
  iodine in, vi. 28; vii. 513
  iodine-glycerin in, vi. 37
  iodine oil emulsion in, vi. 37
  ipecacuanha in, vii. 510
  mercurials in, vii. 510
  mercury bichloride in, vii. 510, 515
  nitrogen in, vii. 515
  opium in, vii. 510
  oxygen in, vii. 275, 515
  paracentesis in, vii. 512

F. J. Cotton (Boston Med. and Surg. Jour., Nov. 25, 1915) states that many methods have been devised to allow a valve action at the site of the wound. He recommends a dressing made of rubber drawn over the edge of the drainage tube.

  pleurotomy in, vii. 511
  potassium iodide in, vii. 515
  potassium permanganate in, vii. 513
  purgation in, vii. 510
  quinine sulphate in, vii. 510
  respiratory exercises in, vii. 513
  rib excision in, vii. 515
    resection in, vii. 512, 514
      quinine and urea hydrochloride anesthesia in, iii. 394
  salicylic acid in, vii. 513
  Schede's operation in, vii. 513
  scraping in, vii. 515
  thoracotomy in, iii. 188; vii. 510, 512, 515
  turpentine in, vii. 510
  valve or suction apparatus in, vii. 513
  zinc chloride in, vii. 515
 of the ethmoidal sinus, vii. 213
 of the frontal sinus, vii. 213
 of the maxillary sinus, vii. 213; viii. 142
 of the pericardium, iii. 193
 of the sphenoidal sinus, viii. 159
 parapneumonic.

Parapneumonic empyema, a term introduced by Lemoyne in 1893, and denoting the occurrence of fluid in the pleural cavity coincident with pneumonia, was observed by Gerdine (Amer. Jour. Dis. of Children, Jan., 1916) in 6 out of 15 cases of typical lobar or bronchopneumonia. Fluid is present in the pleural cavity in many cases of pneumonia before the crisis and can be demonstrated, sometimes by physical signs, sometimes by X-ray, and by puncture. In the majority of cases it is serofibrinous. Only in cases with organisms of high virulence should surgical interference be considered.

Encapsulated tumors, quinine and urea hydrochloride anesthesia in, iii. 395
Encephalitis, vi. 589

Examination of 7 cases of parenchymatous encephalitis by McIntosh and Fildes (Brain, Mar., 1915) showed that in 6 of these spirochetes were present. When sections in these positive cases were cut, however, they were detected in only 3.

Essential epilepsy developing in a child without provocation or apparent cause, according to Comby (Bull. de la Soc. de Pediat., June, 1914), is not an inherited affection. This old notion must be abandoned and epilepsy recognized as an acquired, accidental malady, the relic, most commonly, of an encephalitis. Chorea is another neurosis of the same character, due to some infectious disease.

 acute anterior polioencephalitis, vi. 592
 acute hemorrhagic, vi. 592
  symptomatic treatment in, vi. 592
 acute superior and inferior, vi. 593
 purulent meningoencephalitis, vi. 589
  evacuate the pus in, ii. 592
  ice-bag to head in, vi. 592
  trephining in, vi. 592
Encephalocele, vi. 602; see also Hernia Cerebri, v. 171 and Cerebral Injuries, this Index.
  antiseptic dressings, v. 172
  Keen's operation, v. 171
  pressure in, v. 172
  skin grafts in, v. 172

According to R. Leriche (Lyon chir., xiii, 448, 1916), early persisting encephaloceles are frequently curable. Being due to an irritation resulting from an insufficient trephining, they should be treated by enlargement of the osseous breach until meningeal and cerebral healthy tissues are met.

Active treatment for persistent prolapse of the brain is advocated by O. Mayer (Zeit. f. Ohrenh. u. f. d. Krankh. d. Luftwege, lxxiii, 37, 1915). It is not necessary to wait until the prolapse has healed over to be sure of asepsis. After its removal, the defect, both in bone and dura, should be closed by a plastic operation. He has done this successfully in 1 instance with a flap of periosteum.

Enchondromata of Fallopian tubes, vii. 249
Endarteritis, cerebral, phosphorus in, vii. 455
  salvarsan in, iv. 455
 syphilitic, potassium iodide in, vi. 24
Endemic chorea, iii. 331
 neuritis, vi. 798
Endoaneurismorrhaphy, i. 680
Endocarditis, iv. 470

An early diagnosis can be made in subacute bacterial endocarditis, according to Dickson and Wilbur (Calif. State Jour. of Med., Nov., 1914). Painful nodules in the skin, petechiæ in the skin, mouth and conjunctiva; Gram-positive diplococci in the urine when a local cause can be excluded; and the characteristic diplostreptococcus in the blood are all suggestive signs.

Streptococcus viridans was found by Oille, Graham and Detweiler (Jour. Amer. Med. Assoc., Oct. 2, 1915) in the blood of 26 patients suffering from endocarditis. Most of them looked and felt well, though nearly all had some slight rise of temperature of an irregular type at some time during 1 to 2 weeks. In 17 of the cases, the diagnosis was only made clear by blood-culture. Some cases suggested tuberculosis, gastric ulcer, others typhoid or chlorosis, and the largest number neurasthenia. Endocarditis due to this streptococcus is much commoner than that due to rheumatism; it commonly follows tonsillitis in children and young women.

 acute, iv. 470
  adonis vernalis in, iv. 477
  alcohol in, iv. 477
  ammonia in, iv. 476, 477
Endocarditis, acute (*continued*).
  ammonium carbonate in, iv. 477
  arsenic in, iv. 477
  blood-pressure in, ii. 494
  bodily rest in, iv. 477
  brandy in, iv. 477
  bromides in, iv. 478
  camphor in, iv. 477
  chloral in, iv. 478
  chloralamide in, iv. 478
  cimicifuga in, iv. 476
  digitalis in, iv. 140
  digitalone in, iv. 477
  gold chloride in, iv. 477
  ice-bag in, iv. 476
  iron in, iv. 476
  layer of cotton-wool in, iv. 476
  morphine in, iv. 476, 478
  quinine in, iii. 385; iv. 476

In the special heart clinic conducted in the Massachusetts General Hospital to study early or suspected endocarditis in children, it was shown, according to Eustes (Boston Med. and Surg. Jour., Sept. 2, 1915), that strict rest in bed for weeks or months is of great prophylactic value.

  salicylates in, iv. 477
  salvarsan in, iv. 477
  sera in, iv. 478
  sodium bicarbonate in, iv. 478
  sodium bromide in, iv. 476
  sodium salicylate in, iv. 477
  sparteine sulphate in, iv. 477
  streptococcus vaccine in, ii. 337, 338
  strophanthin in, iv. 477
  strophanthus in, iv. 477
  trional in, iv. 478
  vaccines in, iv. 478
  whisky in, iv. 477
 chronic, iv. 478
  ammonium bromide in, iv. 481
  cardiac stimulants in, iv. 481
  codeine in, iv. 481
  Credé's ointment in, iv. 481
  diet in, iv. 481
  digitalis in, iv. 141
  good air in, iv. 481
  hexamethylenamine in, iv. 481
  hydrotherapy in, iv. 481
  iodides in, iv. 481
  nitrites in, iv. 481
  quinine in, iii. 385; iv. 481
  rest in, iv. 481

Endocarditis, chronic (*continued*).
  sera in, iv. 481
  sodium bromide in, iv. 481
  sunshine in, iv. 481
  tonics in, iv. 481
  trional in, iv. 481
  vaccines in, iv. 481
  veronal in, iv. 481
 infectious, camphorated oil in, ii. 729
 malignant, pneumococcic vaccine in, ii. 333
 prophylaxis, iv. 476
  alkalies in, iv. 476
  avoidance of cold and wet in, iv. 476
  blisters in, iv. 476
  bodily quiet in, iv. 476
  cold sponging in, iv. 476
  digitalin in, iv. 476
  ice in, iv. 476
  iodine tincture to tonsils in, iv. 476
  iodine over precordium in, iv. 476
  leeches in, iv. 476
  morphine in, iv. 476
  oxygen in, iv. 476
  quinine in, iv. 476
  removal of infected tonsils in, iv. 476

In a study of the sequelæ of acute tonsillitis, W. G. Harrison (So. Med. Jour., viii, 59, 1915) refers to 6 cases in which **tonsillectomy** was performed during an attack of acute endocarditis with distinct benefit as regards the cardiac disorder. The milder attacks of tonsillitis are more apt to be followed by arthritis than the severe. Cultures should be made from the tonsil in all cases of joint or heart involvement and properly preserved. From these vaccines can be made for use in case the fever and other signs of infection fail to disappear within a reasonable time after operation.

Acute endocarditis was observed by Fleischner (Arch. of Pediatrics, Feb., 1917) in children in the course of a subacute inflammation of the tonsils. A tonsillectomy was done in each case.

  salicylates in, iv. 476
  strychnine in, iv. 476
  urotropin in, iv. 476
  woolen underclothing in, iv. 476
 rheumatic, collargol in, iii. 535

Endocarditis, rheumatic (*continued*).
  iron in, vi. 87
  sodium salicylate in, vi. 87
 septic, collargol in, iii. 535

W. Gilman Thompson (Vt. Med. Mthly., Feb., 1914) bases the diagnosis of septic endocarditis in many cases on findings other than positive blood-cultures, viz., (1) Irregular fever for many months. (2) Absence of other demonstrable lesions than those of the heart. (3) Minute petechiæ. (4) Development of loud, harsh murmurs. (5) Marked irritability of the heart, shown by overaction, and wide fluctuations in the pulse-rate and character, irrespective of the temperature-curve. Pyorrhea alveolaris may account for many otherwise obscure cases.

  streptococcus vaccine in, ii. 339
Endocervicitis, iodoform vapor in, vi. 53
 catarrhal, ichthyol in, v. 637
Endometritis, iv. 504

Diagnosis, iv. 506.—According to W. S. Gardner (Jour. Amer. Med. Assoc., May 29, 1915), the premenstrual endometrium is frequently mistaken for some pathologic state. *Non-malignant overgrowths* of the endometrium are comparatively common. In some instances the whole endometrium is thickened; in others, pedunculated masses of greater or less extent. The chief symptom is hemorrhage, persistent but not profuse, lasting weeks or months, and resembling that of cancer. The age incidence is the same, and it is, therefore, very important to examine scrapings microscopically.

The clinical histories and histological findings were studied by J. W. Warner (N. Y. Med. Jour., June 12, 1915) in 127 cases of uterine scrapings in conditions other than cancer, the specimens being obtained within 10 days before or after menstruation. All were reported as having some form of endometritis. While 85 per cent. showed the lesions of true inflammation, 12 per cent. were not inflammatory. The cases curetted in the resting stage all showed the changes of true chronic endometritis. The author holds that more attention be paid to menstrual variations.

Etiology, iv. 507.—Most gynecologists believe, according to Neisser (Med. Klin., xi, 511, 1915), that when a hitherto healthy woman develops within the first year or so of married life, or after her first pregnancy, an ascending endometritis and adnexitis, the latter is surely gonorrheal in origin, though examinations of the husband have failed to demonstrate gonococci. The writer believes that in most instances there may not be a true gonococcal infection. Many of the failures of gonococcal vaccines are attributed to this fact. Other organisms may be forced into the uterus by douches given under high pressure. Moreover, in post-gonorrheal urethritis in the male, quantities of bacteria of various kinds are harbored in the urethra long after gonococci have disappeared. In some cases these organisms may cause inflammation of the female organs.

- **aluminum sulphate in, i. 587**
- **alumnol in, i. 591**
- **aristol in, ii. 118**
- **bacterial vaccines in, ii. 368**
- **colon bacillus vaccine in, ii. 372**
- **curettement in, vi. 42**
- **iodine (nascent) in, vi. 44**
- **iodine tincture in, vi. 42, 43**
- **iodoform vapor in, vi. 53**
- **phenosalyl in, vii. 446**
- **pituitrin in, i. 779**

acute, iv. 512
- **counterirritants in, iv. 512**
- **creolin in, iv. 512**
- **curettage in, iv. 506, 512**
- **diet in, iv. 512**
- **evacuation of uterus in, iv. 512**
- **hot douches in, iv. 512**
- **hot drinks in, iv. 512**
- **hot poultices in, iv. 512**
- **hot-water bags to legs in, iv. 512**
- **ice-bag in, iv. 512**
- **ichthyol in, iv. 512**
- **intra-uterine douches in, iv. 512**
- **ipecac in, iv. 512**
- **laxatives in, iv. 512**
- **lobelia in, iv. 512**

Endometritis, acute (*continued*).
- **mercury bichloride in, iv. 512**
- **rest in, iv. 512**
- **scarification of cervix in, iv. 512**
- **tampons in, iv. 512**
- **tartar emetic in, iv. 512**
- **tonics in, iv. 512**
- **vaginal douches in, iv. 512**
- **warm sitz-bath in, iv. 512**

cervical, **nitric acid in, vii. 46**

chronic, iv. 513
- **antiseptics in, iv. 513, 514**
- **argyrol in, iv. 515**
- **astringents in, iv. 513**
- **Bier's hyperemia in, v. 597**
- **boric acid in, iv. 515**
- **boroglyceride in, iv. 515**
- **creosote in, iv. 515**
- **curettage in, iv. 513, 515**
- **diet in, iv. 515**
- **dilatation in, iv. 513, 514, 515**
- **drainage in, iv. 513**
- **formalin in, iv. 515; iv. 734**
- **galvanic current in, iv. 513**
- **gauze packing in, iv. 515**
- **glycerin in, iv. 515**
- **hot vaginal douche in, iv. 513, 514, 515**
- **hydrastis in, v. 545**
- **ichthyol in, iv. 512, 513, 514, 515**
- **iodine in, iv. 515; vi. 43**
- **iodoform ointment in, iv. 515**
- **iodoform tampons in, iv. 512, 513, 515**
- **iodoform vapor in, vi. 53**
- **irrigation in, iv. 513**
- **laminaria tent in, iv. 515**
- **laxatives in, iv. 514**
- **lysol in, iv. 513**
- **magnesium sulphate in, iv. 514**
- **massage in, iv. 514**
- **mercury bichloride in, iv. 515**
- **naphthalin in, iv. 512**
- **out-of-door exercise in, iv. 514**
- **phenol in, iv. 513, 515**
- **picric acid in, iv. 513**
- **potassium permanganate in, iv. 513**
- **pyroligneous acid in, iv. 515**
- **restriction of coitus in, iv. 514**
- **salt solution in, iv. 515**
- **silver nitrate in, iv. 515**
- **thymol in, iv. 515**
- **tonics in, iv. 514**

The efficiency of **turpentine** in puerperal endometritis is recalled by Gutierrez (Semana Medica, Feb. 25, 1915). A wick of gauze impregnated with it is introduced into the uterus. It induces such profuse exudation that any retained scraps are washed out. The uterus is rinsed out beforehand with simple boiled water.

    urethral sound in, iv. 513
    zinc chloride in, iv. 513, 515
  chronic cervical, iv. 515
    creosote in, iv. 515
    glycerin in, iv. 515
    iodine in, iv. 515
    iron chloride in, iv. 515
    iron persulphate in, iv. 515
    phenol in, iv. 515
    potassium permanganate in, iv. 515
    zinc chloride in, iv. 515
  fungous, picric acid in, vii. 461
  gonorrheal, alumnol in, i. 591
    boric acid in, iv. 515
    curettage in, iv. 516
    diet in, iv. 515
    galvanic current in, iv. 515
    hydrogen dioxide in, v. 569
    iodine in, iv. 515, 516
    iodine-glycerin tampon in, iv. 516
    iodized phenol in, iv. 515
    puncture of Nabothian glands in, iv. 516
    saline solution in, iv. 515
    silver nitrate in, iv. 515, 516
  postabortive (granulomatous), iodine fumigations in, vi. 44
  senile, iv. 514
    antiseptic solutions in, iv. 514
    dilatation of cervix in, iv. 514
  subacute, hydrogen dioxide in, v. 570
Endometrium, adenocarcinoma of, viii. 760
  carcinoma of the, viii. 760
  granular, nitric acid in, vii. 46
  sarcoma of, viii. 761
Endoscopy, vi. 243, 245, 246, 260
Endothelioma, see Cancer, ii. 734
  of peritoneum, vii. 397
End-to-end anastomosis after enterectomy, i. 70
  Connell's method in, i. 70
  Maunsell's method in, i. 70
  Murphy button in, i. 71
  simple suture method in, i. 70
Enlarged ear lobule, plastic surgery for, viii. 444
  glands, iodine in, iii. 676
  prostate, see Prostate Hypertrophy of, viii. 709; also this Index.
Enlarged tonsils, see Tonsils, Hypertrophy of, vii. 416; also this Index.
Enlargement of the lymphatics, viii. 535
  of thymus, viii. 535
Enophthalmos, vii. 209
Ensiform process, dislocation of, iv. 308
Enteralgia, hydrocyanic acid in, v. 564
  opium tincture in, vii. 189
Enterectomy, i. 61

Resection of a wounded coil of small intestine, according to Richards and Fraser (Brit. Med. Jour., July 1, 1916), is sometimes followed by obstruction, the segments of intestine above the union becoming distended, while the segment below remains contracted. A case in which this complication has occurred may possibly be saved by a subsequent short circuiting of the affected coil.

    saline solution in, i. 63
  end-to-end anastomosis after, i. 70

A new method of aseptic enterectomy and enteroanastomosis is described by Gudin (Paris méd., Dec. 16, 1916), which is based on crushing with clamps of the visceral layers of the parts operated on. In end to end anastomosis, Kocher forceps are placed at the margins of the previously crushed sections of bowel, and the piece of bowel to be taken out removed by passing the scalpel along the closed forceps. The 2 forceps are then placed side by side, and 2 continuous seroserous sutures carried successfully through the adjoining bowel tissues along one side of the forceps, next round their tips, and finally back again along the other side. The forceps are then removed—the bowel ends having already been united all around except at one point, the point of entrance of the forceps—and a grooved director is passed in and moved from side to side, thus detaching the previously adherent margins of the serous coats, unfolding the mucous and muscular coats, and restoring communication between the two bowel ends. The suture ends hanging out are now tied, thus closing the opening. In laterolateral anastomosis, as in gastroenteros-

tomy, the 2 linear portions of visceral wall to be joined are first crushed; 2 continuous sutures are then passed completely round these portions except at one point, through which scissors are introduced to cut through the serous coats before the sutures are tied. The perfect results obtained were confirmed by post-mortem examinations.

Enteric fever, see Typhoid Fever, viii. 635; also this Index.
Enteritis, see Intestinal Catarrh, v. 706, 709, 749; also this Index.
  croupous or diphtheritic, v. 714
  phlegmonous, v. 714
  tuberculous, see Intestinal Tuberculosis, v. 752, also this Index.
Enteroanastomosis, i. 63
  after enterectomy, i. 70
  in hernia, v. 465, 466
Enteroclysis, see Saline Solution, viii. 195
Enterocolitis, see Intestinal Catarrh, v. 706, 709, 749; also this Index.
  bile in, i. 798
  cold baths in, iii. 531
  resorcin in, vii. 809
  ulcerative, emetine hydrochloride in, vi. 60
Enterocolonic irrigator, i. 86
Enteroexclusion, i. 72
Enterogenous multiple neuritis, vi. 798
Enteroptosis, see Visceroptosis, v. 770; also this Index.
Enterorrhaphy, i. 60
  circular, in hernia, v. 465
Enterostomy, i. 73

A simple effective method of enterostomy in intestinal obstruction is described by J. W. Long (Jour. Amer. Med. Assoc., Mar. 17, 1917). A purse-string suture is placed in the distended intestine and the gut slowly opened by means of the pencil point of a cautery, followed by the insertion of a soft rubber tube and the tying of the suture with inversion of the intestinal edges. The omentum is then stitched to the intestine about the tube. The method is rapid, and provides for prompt healing of the wound after stopping drainage.

Entropion, iv. 728
  canthotomy in, iv. 729
Entropion (*continued*).
  excision of strip of skin in, iv. 728
  grafts in, iv. 729
  grooving the tarsus in, iv. 729
  Hotz operation in, iv. 728
Enuresis, iv. 516

H. G. Bugbee (Jour. Amer. Med. Assoc., Mar. 3, 1917) has studied the cause of frequent urination in girls and women in 1000 cases. Concomitant complications of the sexual and child-bearing functions were the most common causes; in the earlier age periods acute infections were the main factors when these affected the urethra or trigone. Postoperative catheterization was a relatively common cause of frequent micturition.

Enuresis, both in children and adults, not necessarily merely nocturnal, may occasionally be a sign of spina bifida occulta, and may exist without other signs, according to W. G. Spiller (Amer. Jour. Med. Sci., Apr., 1916). Examination of the sacrum and lower lumbar vertebræ by X-rays readily determines the defect.

Cases of enuresis developing suddenly in soldiers on the firing line were found by Böhme (Münch. med. Woch., May 25, 1915) to have practically in every instance suffered from enuresis in childhood. Warmth, rest, avoidance of much fluid, none after 6 P.M., generally overcame it.

  actual cautery in, iv. 523
  antipyrin in, iv. 524
  atropine in, iv. 521, 522, 524, 527
  bathing in, iv. 526
  belladonna in, ii. 449; iv. 521, 522
  benzoic acid in, ii. 456
  bismuth in, iv. 521
  blistering the perineum in, iv. 523
  buchu in, ii. 695
  camphor (monobromated) in, iv. 524
  cantharides in, iii. 13
  Cathelin method in, iv. 524
  cauterization of internal sphincter in, iv. 528
  chloral hydrate in, iii. 210
  circumcision in, iv. 518
  cold sponging along spine in, iv. 524
  collodion in, iv. 527

Enuresis (*continued*).
  conscious repetition of Brissaud in, iv. 522
  cubeb in, iii. 711
  cutting off fluids in late afternoon and evening in, iv. 523
  diet in, iv. 520, 522, 524, 526
  distention of bladder with boric acid solution in, iv. 522
  douching of perineum with cold water in, iv. 521
  Dudley operation in, iv. 528
  epidural injections of saline solution in, iv. 524, 525
  ergot in, iv. 524, 527, 572
  eumydrin in, iv. 706
  exercise in, iv. 526
  faradic current in, iv. 521
  flexible bougie in, iv. 523
  Frank operation in, iv. 527
  Gersuny's operation in, iv. 528
  hard mattress in, iv. 524
  hot-water compresses in, iv. 521

The remarkable frequency of incontinence of urine among soldiers on active duty is emphasized by Fuchs and Gross (Wiener klin. Woch., Nov. 23, 1916). A history of trauma, chilling, or some infectious disease was found in every case. The bladder walls were in a state of maximal contracture, but the sphincter region seemed to be normal. Prompt and permanent relief followed warm fluid irrigations of the bladder, the heat of the fluid being gradually increased until 45° to 48° C. (113° to 118° F.) is reached.

  hydrastis in, v. 545
  hypnotherapy in, viii. 421
  iron iodide in, iv. 520
  Kelly operation in, iv. 528
  laxatives in, iv. 521
  massage of abdomen in, iv. 521
  mechanical dilatation in, iv. 522
  morning and afternoon nap in, iv. 520
  nux vomica in, iv. 521; vii. 150
  organotherapy in, iv. 525
  out-of-door exercise in, iv. 520
  paraffin in, iv. 527
  pepsin in, iv. 520
  peptomangan in, iv. 520
  potassium bromide in, iv. 524, 526
  potassium citrate in, iv. 522; vii. 578

Enuresis (*continued*).
  potassium iodide in, iv. 526
  quinine in, iii. 388
  raising foot of bed in, iv. 520
  removal of adenoids in, iv. 524
  removal of hypertrophied tonsils in, iv. 524
  rhus aromatica in, iv. 524
  rhus toxicodendron in, iv. 524
  sacral anesthesia in, viii. 217
  saline solution in, iv. 524, 525
  salol in, iv. 522
  santonin in, viii. 72
  silver nitrate in, iii. 676; iv. 523
  sodium phosphate (acid) in, iv. 552
  strychnine in, iv. 521, 522; vii. 150
  suprarenal gland in, iv. 525
  thyroid gland in, i. 738, 739; iv. 525, 526
  tonics in, iv. 520, 524
  urination at regular hours in, iv. 523

Whether diurnal or nocturnal, or both, Newlin (Arch. of Pediat., Oct., 1914) has obtained the best results by anticipating the involuntary act by a voluntary emptying of the bladder. When carried out systematically, this can preclude the use of drugs.

  urotropin in, iv. 522
  uva ursi in, viii. 763
  vaccine in, iv. 522
  waking up to urinate regularly in, iv. 520
 of bladder atony, turpentine in, viii. 635
 of colon bacilluria, hyoscyamus in, v. 579
Eosin and methylene blue stain, v. 377
Eosin-hematoxylin staining fluid, v. 377
Eosinophiles, v. 381
Eosote, iii. 679
Ephemeral fever, see Miliary Fever, vi. 706; also this Index.
Ephidrosis, see Hyperidrosis, viii. 445
Ephilides, see Lentigo, vi. 315; also this Index.
Epicanthus, iv. 726
Epicondyle fractures, iv. 770
Epidemic chorea, iii. 331
 dropsy of India, ii. 194
 hemoglobinuria, vii. 41
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Epididymitis, vii. 356
  aconite in, i. 285
  aluminum acetate in, vii. 357
  antiseptic dressing in, vii. 358
  antiseptic-fluid irrigation in, vii. 358

In acute epididymitis **aspiratory puncture** is recommended by H. W. E. Walther (Med. Rec., Oct. 2, 1915). He uses **ethyl chloride** and in very sensitive patients, **novocaine**. He then thrusts a very sharp, fairly large needle attached to a 10 c.c. syringe into the inflamed epididymis, and aspirates the contents. Usually 2 or 3 punctures are made at different points. Although painful, the relief of pain is almost immediate, and within 6 to 12 hours the swelling and fever are diminished considerably.

bed-rest in, vii. 357
belladonna ointment in, vii. 357
Bier's hyperemia in, v. 594, 597; vii. 357

Murata (Sei-I-Kwai Med. Jour., Oct., 1915) obtained excellent results from 30 Gm. (1 ounce) of **calcium salt solution** injected intravenously. After injection, pain disappeared. No hard induration was left.

cigarette drain in, vii. 358
Credé's ointment in, vii. 357
Eckel's operation in, vii. 359
elevation of scrotum in, vii. 357
epididymectomy in, vii. 358
epididymotomy in, vii. 358, 359

Crosbie and Riley (Boston Med. and Surg. Jour., May 6, 1915) found that **epididymotomy** invariably gave immediate and permanent relief of pain, there being no recurrences after operation unless infection recurred. The epididymitis and urethritis were shortened, and the patients were less likely to be sterile.

evacuation of pus in, vii. 358
excision in, vii. 359
  of indurated nodules in, vii. 358
gauze dressing in, vii. 358
gonococcus vaccine in, ii. 352
guaiacol in, v. 147, 148
Hagner operation in, vii. 358
hot fomentations in, vii. 357
ichthyol in, vii. 357
incision in, vii. 358
  in tunica vaginalis in, vii. 358
lead-water and laudanum in, vii. 357
magnesium sulphate in, vi. 475
Martin operation in, vii. 357
menthol in, vii. 357
mercurial ointment in, vi. 672; vii. 359

Epididymitis (*continued*).
  mercury bichloride solution in, vii. 358
  mixed treatment in, vii. 359

Excellent results were obtained by Asch (Amer. Jour. Surg., June, 1915) from the injection of **novocaine** in acute gonorrheal epididymitis; 6 c.c. (1½ drams) of a sterile 1 per cent. solution of novocaine being injected directly into the epididymis with an ordinary hypodermic syringe armed with a very fine needle. The fluid was evenly distributed throughout the inflamed area by reinserting the needle in different parts without withdrawing it through the skin.

  orchidectomy in, vii. 358
  pilocarpine in, vii. 469
  potassium iodide in, vii. 359
  puncture of hydrocele in, vii. 358
  salt solution in, vii. 358
  silver nitrate in, viii. 139
  strapping in, vii. 357, 359
  sublimate irrigation in, vii. 358
  suspensory in, vii. 357
  T-bandage in, vii. 358
  Wagner operation in, vii. 359
tuberculous, **novocaine anesthesia** in, vii. 103

In the case of a man of 24, who had a fistulous epididymitis, Sofia (Jour. Amer. Med. Assoc., from Policlinico, Jan. 7, 1917) used local injections of Durante's **iodo-iodide** solution (a mixture of **iodine** 1 part, **potassium iodide** 3 parts, and distilled water 100 parts) every fourth day and a subcutaneous dose every day. The cure was almost complete by the end of 1½ years.

J. H. Cunningham, Jr. (Surg., Gynec. and Obstet., Oct., 1916), in tuberculous epididymitis, advocates **castration** or **epididymectomy** as the case may indicate, and the destruction of the lesions in the vesicles and prostate by injecting about 1 dram (4 Gm.) of **crude phenol** into the vas deferens, so as to reach the disease in the vesicles, and following the operative procedures, **tuberculin** and **hygiene** continued indefinitely.

Epididymo-orchitis, **gonococcus vaccine** in, ii. 351

Epidural anesthesia, see Sacral Anesthesia, viii. 216
Epigastric hernia, v. 490
Epiglottis, cancerous ulceration of, orthoform in, vii. 216
  tuberculous ulcers of, chloretone in, iii. 219
Epilepsies, anomalous, iii. 637
Epilepsy, iv. 528

Etiology, iv. 537.—The *ductless glands* have, in recent years, attracted considerable attention in this connection. Sajous, in 1907, advanced the view that the adrenal system, composed of the pituitrin, thyroid and adrenals is a factor. Inadequacy of this system, by reducing in proportion the destruction of toxic wastes, allowed these to accumulate in the blood, and to promote a defensive reaction having for its purpose hydrolytic destruction of these wastes. This reaction, however, by causing a marked rise of blood-pressure, induced the epileptic convulsions. Many authors have since connected the ductless glands with the disease.

True epilepsy, representing about 35 per cent. of all forms, according to Bolten (Nederlandsch Tijdsch. v. Geneesk., June 28, 1913), is due to a toxemia by normal food and cell products, developed when these fail to be sufficiently neutralized by the action of the thyroid and parathyroid glands which normally serve to protect the central nervous system against toxins. The glandular insufficiency may be due to some disorder of the sympathetic system, but the cortical lesions are secondary to the chronic intoxication. Injections of freshly expressed beef thyroid and parathyroid juice caused a complete disappearance of the symptoms.

C. C. Johnston (Jour. Amer. Med. Assoc., Nov. 1, 1913) called attention to the presence in certain cases of an overgrowth of the anterior and posterior clinoid process, which overlapped the pituitary body, as shown by radiography, and suggested a relationship between this anomaly and epilepsy. Pierce Clark and E. W. Caldwell (Jour. Amer. Med. Assoc., Jan. 3, 1914) enumerated symptoms, slow pulse, vasomotor stasis in the extremities, tendency to obesity and bulimia, as suggestive of pituitary disorder.

In a study of epilepsy from the X-ray standpoint, based on 95 cases, 7 were found to be pituitary tumors without bony thickening, but instead local thinning of the body of the sphenoid or the clinoid processes from pressure was almost constant. In 16 cases observed by McKennan, Johnston and Hemminger (Jour. Nerv. and Mental Dis., Aug., 1914) there was local thickening of bony tissue that was confined to enlargement alone of the clinoid processes, or to thickening in the anterior fossa of the base of the skull. In 22 cases the local bony change was found in two situations, namely, the clinoid processes and the base of the anterior fossa. In 35 cases there were bony changes in three situations, namely, the clinoid processes, the anterior fossa and the body of the sphenoid bone. In these cases there is an appearance of thickening along the entire base of the skull. In 15 cases no bony alterations were found. The authors found a condition of local acromegaly in essential epilepsy, which they believe can only be due to venous stasis. It would appear that so-called idiopathic or essential epilepsy is due to a mechanical injury of the pituitary gland.

Cotton, Corson-White and Stevenson (N. Y. Med. Jour., Sept. 16, 1916) conclude that at least 1 type of epilepsy is probably dependent upon absorption of toxic or poisonous products from the intestinal canal. This stasis may be produced by an overaction of the suprarenal gland. Hyperactivity of the adrenal gland may be caused by dysfunction of the pituitary or pancreas, irritation of the duodenum, or severe fright or emotional disturbance.

Various data, according to Tedeschi (Riforma Medica, Feb. 17, 1917), sustain the assumption that tobacco is able to induce actual epilepsy in certain rare cases, even in the absence of a special predisposition. The writer traces several cases to it.

C. A. L. Reed (Jour. Amer. Med. Assoc., May 20, 1916) regards constipation as an essential factor in epilepsy, and that it entails an infection by a specific organism, the *Bacillus epilepticus.* It invades the system through the alimentary canal, its chief focus being the cecum. Being spore-bearing, it perpetuates itself indefinitely in both the cecum and blood. In a few cases, it is overcome by the natural immunity, but only where there is no focus in the intestines. Hence the possibility of spontaneous recovery.

To test the claims of C. A. L. Reed, W. B. Terhune (Jour. Amer. Med. Assoc., Oct. 14, 1916) studied blood-cultures from 24 epileptics and obtained positive cultures in 75 per cent. of the cases. The organism was not constant, the same case often giving positive and negative results on different occasions. It was absent from non-epileptics. It was found to produce epileptoid attacks in cats, both after intravenous inoculation and feeding. After death the organism could be recovered from their blood.

Shanahan, Munson and Shaw (N. Y. Med. Jour., Apr. 29, 1916), among 1473 epileptics in the Craig Colony, obtained a positive Wassermann reaction in less than 2 per cent.

Pathology, iv. 541.—Abnormalities of *cardiovascular phenomena* occur in the vast majority of epileptic seizures, according to T. E. Satterthwaite (Trans. Amer. Therap. Soc.; Med. Rec., Sept. 23, 1916). Removal of enlarged veins or nevoid growths adjacent to the base of the skull has been followed by cessation of seizures. Epilepsy causes circulatory disturbances, and abnormalities of blood or vessels cause epilepsy.

Bram (N. Y. Med. Jour., Mar. 20, 1915) believes that essential epilepsy is to be attributed to nervous instability accompanied by, and probably the result of, abnormally high intracranial pressure. An attack is probably consequent upon a sudden increase of blood-pressure, associated with a great increase of intracranial tension. He therefore advocates venesection.

Abderhalden's test in, v. 391
idiopathic, blood-pressure in, ii. 494
Jacksonian, blood-pressure in, ii. 493
medical treatment, iv. 547

F. X. Dercum (Jour. Amer. Med. Assoc., July 22, 1916) rightly holds that epilepsy is not a disease entity, and that there cannot be any specific treatment for it. Each case should be subjected to the most thorough investigation, including serological tests and the family history. Treatment will depend largely upon such study.

acetanilide in, i. 226
adonis vernalis in, i. 433
ammonium bromide in, iv. 551, 552
amyl nitrite in, iv. 553; vii. 56
antimony arsenate in, iv. 551
antipyrin in, iv. 549, 551.
antisyphilitic treatment in, iv. 554
arsenic in, iv. 550
baths in, iv. 548, 550, 554
belladonna in, iv. 552
borax in, iv. 549
bromides in, ii. 642; iv. 548-552, 554
calcium bromide in, iv. 552
calcium carbonate in, iv. 555
cālcium hypophosphite in, iv. 555
calcium lactate in, ii. 716; iv. 554, 555

Bryant (Boston Med. and Surg. Jour., Oct. 7, 1915) found that the official syrup of **calcium lactophosphate** used in doses of from 1 to 2 drams (4 to 8 Gm.) 3 times a day, promotes sleep, decreases nervous irritability, and acts in some measure as an antidote to bromine acne.

calomel in, iv. 548
camphor (monobromated) in, ii. 733; iv. 553
cardiac tonics in, iv. 553
Carlsbad waters in, iv. 554
castor oil in, iv. 548
cephalopin in, i. 794
change of environment in, iv. 553
chloral in, iii. 209
chloralamide in, iv. 549

Epilepsy, medical treatment (*continued*).
  chloretone in, iii. 218; iv. 553
  chloroform in, iv. 553
  codliver oil in, iii. 513
  colon irrigations in, iv. 548
  conium in, iii. 550; iv. 552
  crotalin in, iv. 555
  dechlorinized diet in, iv. 552, 554
  diet in, iv. 547, 548, 552, 553, 554

T. A. Williams (Med. Rec., May 8, 1915) identifies the toxics responsible for the paroxysms as a result of an incapacity to metabolize an amount of protein which the average individual can take with impunity. The most important feature of correct management is limitation of the proteins.

  digitalis in, iv. 158
  duboisin in, iv. 347, 553
  ethyl bromide in, iv. 694
  exercise in, iv. 548, 553, 554
  hydriatics in, iv. 553
  hyoscyamus in, iv. 552
  institutional environment in, iv. 547
  iron bromide in, vi. 88
  isolation in, iv. 553
  kidney substance in, i. 792
  lactophenin in, iv. 549

H. A. Knox (N. Y. Med. Jour., Feb. 1. 24, and Mar. 3, 1917) found **leptin**, a preparation of organisms obtained from the intestinal flora and blood of epileptics, capable of increasing the defensive potential and inhibiting the seizures.

  lime in, iv. 555
  lithium bromide in, iv. 551; vi. 367
  lobelia in, vi. 436
  massage in, iv. 548, 553
  menthol in, vi. 649
  neuronal in, vii. 16
  nickel sulphate in, vii. 43
  open air in, iv. 550, 554
  opium in, iv. 553
  opocerebrin in, i. 794
  organotherapy in, iv. 549
  ovarian extract in, i. 788

Treatment by administration of **pancreatin** should, according to Cotton, Corson-White and Stevenson (N. Y. Med. Jour., Sept. 16, 1916) be employed in preference to surgical procedures, and the latter only in long standing, obstinate cases.

  phenacetin in, iv. 549, 551
  physostigma in, vii. 459
  picrotoxin in, iv. 550; vii. 463
  pituitrin in, iv. 554
  placing of epileptic on left side during tonic period, iv. 553
  potassium bromide in, iv. 550, 551, 552
  potassium osmate in, vii. 585
  potassium salts in, iv. 549-552
  rattlesnake venom in, iv. 555
  rest in, iv. 553
  saline purée in, iv. 554
  scopolamine in, viii. 103
  silver in, viii. 136
  sodium biborate in, ii. 588; iv. 549
  sodium bromide in, iv. 550, 551, 552
  sodium chloride restriction in, iv. 552
  sodium chloride withdrawal in, iv. 554
  sodium glycerophosphate in, iv. 554
  spinal anesthesia in, iv. 554
  sponge bath in, iv. 554
  strontium bromide in, iv. 551; viii. 409
  sulphonal in, iv. 549
  thyroid gland in, i. 744, 745, 746, 751; iv. 549, 554
  thyroidine in, iv. 549
  tonic baths in, iv. 548
  trional in, iv. 549; viii. 590
  urethane in, iv. 549
  veronal in, iv. 554
  warm bath in, iv. 548
  water, free use in, iv. 554
  zinc in, viii. 836
 surgical treatment, iv. 555

In view of the evidence of a special bacterial toxin in causing epilepsy, C. A. L. Reed (Jour. Amer. Med. Assoc., Jan. 29, 1916) advocates treatment addressed to (*a*) constitutional preparation for operation, (*b*) restoration of the normal fecal current by such operation as may be indicated, (*c*) post-operative neutralization of the previously established and yet persistent acidosis. (*d*) dehydration of edematous centers, and (*e*) possible immunization by autogenous vaccination.

F. A. Rhodes (Jour. Amer. Med. Assoc., Sept. 23, 1916), in a case of Jacksonian epilepsy giving a history of having been injured twice in the right motor area, removed the motor area by **cautery** with such satisfactory results that he has continued its use in other cases.

Acute angulation and flexure of the sigmoid as a factor in epilepsy are emphasized by W. H. Axtell (Proct. and Gastroenterol., Dec., 1916). Surgery can give relief only when there is a definite history of inflammatory adhesions.

exploratory trephining in, iv. 557
intracranial surgery in, iv. 555
traumatic, viii. 796
Epileptic dementia, vii. 693
idiocy, see Idiocy, Epileptic, this Index.
mania, **ergot** in, iv. 571
veronal in, viii. 807
Epileptiform angina pectoris, **zinc oxide** in, viii. 836
vertigo, **zinc oxide** in, viii. 836
Epinephrin, see Animal Extracts; Adrenals, i. 755
in stovaine anesthesia, viii. 398
Episcleritis, **homatropine** in, v. 540
mercury cyanide injections in, vi. 683
potassium iodide in, vi. 38
stovaine in, viii. 398
pustular, **staphylococcic vaccine** in, ii. 419
Epispadias, viii. 680

J. D. Barney (Surg., Gynec. and Obstet., Nov., 1916) makes, under local anesthesia, an incision through the glans penis to prolong the urethral gutter to its end. The groove is kept from reuniting by means of drains, preferably by rubber tissue, until the mucosa has covered the raw surfaces. A transverse buttonhole incision is cut through the prepuce just below the frenum, and extending laterally nearly to its edges. This flap is brought forward and forms the roof over the urethral gutter. A fold of the pubic skin forms the roof of the urethra at the root of the penis.

incisions, transverse, in, viii. 680
Thiersch's operation in, viii. 680
Epistaxis, iv. 558
acetic acid in, i. 230
aconite in, i. 283
actual cautery in, iv. 562
adrenalin in, iv. 562, 564

W. Lapat (Jour. Amer. Med. Assoc., Oct., 14, 1916) states that when it is difficult to locate the precise source of hemorrhage, an application of **adrenalin** to the anterior portion of the septum, will blanch the whole mucosa except bleeding spots. These stand out clearly against the pale surface as red, circular areas. Cauterization of these spots with 90 per cent. trichloracetic acid soon arrests the bleeding.

albolene in, iv. 562
alum in, i. 585; iv. 562
antipyrin in, ii. 46; iv. 562, 564
arnica in, ii. 118
artificial anemia (Naegle's) in, iv. 563
atropine in, iv. 564
Beck's bismuth paste in, iv. 562
Bellocq's cannula in, iv. 564
benzoin in, iv. 562
Bernay-Simpson tampons in, iv. 562
bismuth in, iv. 562, 564
boric acid in, iv. 562
calcium chloride in, ii. 719; iv. 564
calcium lactate in, ii. 717
carbolized gelatin in, iv. 562
chromic acid in, iv. 562
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collodion in, iv. 562
copper sulphate in, iv. 562
cotarnine hydrochloride in, iii. 675
digitalis in, iv. 158, 564
diphtheria antitoxin in, iv. 564
dry cupping, lumbar, in, iv. 564
elevation of the arms in, iv. 563
emetine hydrochloride in, vi. 60

J. P. Prestley (N. Y. Med. Jour., May 2, 1914) injected hypodermically ½ grain (0.03 Gm.) **emetine hydrochloride**, and in 20 minutes the hemorrhage had ceased entirely.

ergot in, iv. 572
erigeron in, iv. 572
ferripyrin in, vi. 88, 89
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  hydrogen dioxide in, iv. 564; v. 568, 572
  iodoform in, iv. 562
  ipecac in, vi. 59
  iron subsulphate in, vi. 88
  key down the back in, iv. 563
  kino in, vi. 235
  lead acetate in, iv. 562, 564
  liver extract in, i. 797
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  mustard footbaths in, iv. 564
  opium in, iv. 564
  packing in, iv. 562
  phenol in, iv. 562
  pinching the nose in, iv. 563
  potassium permanganate in, iv. 562
  purgatives in, iv. 564
  Rose bag in, iv. 563
  rubber finger-cot in, iv. 562
  rue in, viii. 44
  serum in, iv. 564
  silver nitrate in, iv. 562
  sodium bromide in, iv. 565
  sodium chloride in, iv. 565
  sodium sulphate in, viii. 190
  strychnine nitrate in, iv. 564
  tampons in, iv. 562, 564
  tannic acid in, iv. 562; viii. 498
  thyroid gland in, i. 738
  vaselin in, iv. 562
  vinegar in. iv. 563
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  carbon-dioxide snow in, ii. 788; vii. 787
  cocaine anesthesia in, iii. 493
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  curetting in, ii. 788
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  Finsen light in, ii. 792
  freezing in, iii. 531
  ichthyol ointment in, ii. 788
  Marsden's paste in, ii. 786
  Michel's paste in, viii. 432
  oxygen in, vii. 275
  ozonated-water injections in, vii. 278
  petroleum applications in, vii. 413
  pyrogallol in, ii. 788; vii. 720
  radium in, ii. 791; viii. 829
  stovaine anesthesia in extirpation of, viii. 398
  X-ray in, ii. 12, 788, 789
  zinc sulphate in, viii. 837
Epithelioma (*continued*).
  benign, of the sweat-glands, viii. 448
  of the conjunctiva, iii. 588
  of the eyelids, see Eyelids, Epitheliomata, iv. 723
  of the lip, intravenous anesthesia in, iv. 689
  of the penis, vii. 345
  of skull, v. 175
  of the tongue, viii. 567
Epitrochlear fractures, iv. 770
Epsom salts, see Magnesium, vi. 468
Epulis, vi. 729
Equinia, see Glanders, v. 19; also this Index.
Erasion of joints, vi. 106
Erb's paralysis, see Myasthenia Gravis, vi. 743, and Obstetrical Paralysis, vii. 26; also this Index.
Erectile tumors of scalp, v. 165
Ergone, iv. 566
Ergot, iv. 565
  gangrene, iv. 795
  poisoning, acute, iv. 568

Tetany following poisoning by ergot, taken to cause abortion, was observed by Emsheimer (N. Y. Med. Jour., Dec. 18, 1915). Within 10 minutes of the administration of 15 grains (1 Gm.) of **chloral hydrate** and 30 grains (2 Gm.) of the **triple bromides**, per rectum, full consciousness returned, and the spasm of hands and feet began to relax.

    amyl nitrite in, iv. 570
    brandy in, iv. 570
    castor oil in, iv. 570
    Epsom salts in, iv. 570
    recumbent posture in, iv. 570
    tannic acid in, iv. 570
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Erosions. alumnol in, i. 591
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  bromides in, viii. 355
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  aconite in, i. 283
  adrenalin chloride in, iv. 583
  alcohol in, i. 525, 532; iv. 580, 581, 584
  aluminum acetate in, i. 588
  aluminum borotartrate in, i. 589
  alumnol in, i. 591
  antistreptococcic serum in, iv. 587
  atropine in, ii. 451
  bacterial vaccines in, iv. 586
  Bier's hyperemia in, v. 591
  blisters in, iii. 676
  boric acid in, ii. 585; iv. 581
  boroglyceride in, vi. 37
  bowel regulation in, iv. 585
  bromphenol in, vii. 445
  buttermilk applications in, iv. 581
  calomel in, iv. 580
  camphor in, ii. 733; iv. 580, 584
  chloral in, iv. 580
  chlorinated lime in, iv. 581
  cold-water applications in, iv. 580-82
  collargol in, iii. 535
  collodion in, iii. 536
  creosote in, iii. 688
  diazo-reaction in, iv. 107
  diet in, iv. 585
  diphtheria antitoxin in, iv. 585
  erysipelas vaccine in, iv. 586
  europhen in, iv. 709
  guaiacol in, v. 148
  hot-air douche in, iv. 580
  hot saline compresses in, iv. 581
  hydrochloric acid in iv. 580
  hydrogen dioxide in, iv. 583
  ichthyol in, iv. 580, 581, 583; v. 638; vi. 37
  incisions in, iv. 585
  iodine (nascent) in, vi. 53
  iodine tincture in, vi. 30, 37
  iron in, vi. 87, 88
  iron chloride in, iv. 585
  iron salicylate in, viii. 56

Erysipelas (*continued*).
  lead and opium wash in, iv. 581
  light therapy in, vi. 361

L. B. Williams (Amer. Jour. Electrotherap. and Radiol., Feb., 1917) reports good results from **radiant light** in both mild and severe cases. A 50-candle power incandescent therapeutic lamp was used at a distance of 18 inches for 20 minutes every 2 to 3 hours. Next day there was visible just a fringe of erysipelatous "margin" at one spot. Next day there was no trace of erysipelas, though later a slight recrudescence was noted, which was dispelled by further treatment.

  lime-water applications in, ii. 720
  lysol in, viii. 503
  magnesium sulphate in, iv. 581; vi. 476
  mercury (ammoniated) ointment in, iv. 584
  mercury bichloride in, iv. 581, 582
  mercury biniodide in, iv. 581

Nobécourt (Bull. et mém. Soc. Méd. des Hôp. de Paris, Dec. 2, 1915) urges the use of 5 per cent. aqueous solution of **methylene blue** as a paint to cover erysipelatous areas of the face. No dressing is applied. The pain soon ceases. Applications are made night and morning for 2 or 3 days.

  paraffin ointment in, iv. 581
  phenol in, iv. 581-2, 584-5; vii. 443
  picric acid in, iv. 581; vii. 461
  pilocarpine in, vii. 469
  pituitary gland in, i. 780
  potassium-mercuric iodide in, vii. 584
  potassium sozoiodolate in, vii. 585
  quinine in, iii. 385
  red light in, iv. 580
  resorcin in, iv. 581
  silver nitrate in, viii. 139
  sodium borate in, ii. 588
  sodium nucleinate in, iv. 581
  sodium salicylate in, iv. 581; vi. 87
  sodium thiosulphate in, iv. 581
  streptococcus vaccine in, ii. 336; iv. 586
  thyroid gland in, i. 740
  trichlorphenol in, vii. 445
  vaccine therapy in, iv. 586
  vaselin in, iv. 583
  zinc oxide in, iv. 583

Erysipelas (*continued*).
  and hematuria, v. 398
  of the pharynx, see Pharynx, Erysipelas of, vii. 427; also this Index.
Erythema, iv. 587

H. A. Christian (Trans. Amer. Med. Assoc.; N. Y. Med. Jour., June 9, 1917) holds that there is a definite clinical entity with skin lesions of the erythema group, purpura, erythema, urticaria, and angioneurotic edema, in which visceral lesions occur as the result of the same type of lesion. The most common of these manifestations are arthritis, gastrointestinal symptoms, hematuria, and various renal disturbances. The visceral disturbances occur unaccompanied by the skin lesions. The disease is due to some disturbance in the small blood-vessels, almost always focal, causing dilatation, diapedesis, and exudation.. The ultimate cause is unknown.

    alcohol in, i. 532
    belladonna in, ii. 451
    bismuth subnitrate in, ii. 474
    calcium lactate in, ii. 718
  annular.

L. Fonss (Ugeskrift f. Laeger, Jan. 28, 1915) describes a small epidemic of annular erythema among patients whose ages ranged from 3 to 17 years. The first case was that of a girl, aged 9, who developed a rash which spread from the face to the trunk and limbs, being most prominent on the extensor aspect of the arms. On the face the rash was diffuse, and most noticeable on the cheeks. On the arms it formed definite rings, several being confluent.

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  choleraicum, iv. 591
  diphtheriticum, iv. 591
  exudativum multiforme, iv. 594
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    phosphorus in, iv. 597
    potassium iodide in, iv. 596
    quinine in, iv. 597
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    salicylates in, iv. 596
    salicylic acid in, iv. 596, 597; viii. 58
    salicylic ointment in, viii. 58
    salol in, iv. 596
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    sodium salicylate in, iv. 596
    sodium sulphite in, iv. 597
    sodium thiosulphate in, iv. 597
    strontium iodide in, viii. 409
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    codliver oil in, iv. 594
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    out-of-door life in, iv. 594
    thyroid gland in, iv. 594
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  infantilis, iv. 590
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  læve, iv. 590
  medicamentosum, iv. 590
  neonatorum, iv. 589
  nodosum, iv. 597

Jaquerod (Revue Méd. de la Suisse Rom., June, 1916) states that evidence is accumulating that associated or subsequent tuberculous lesions bear a causal relation to the skin disease. Chauffard found a typical erythematous node develop at the point of injection of tuberculin in a tuberculous girl. Landouzy discovered a tubercle bacillus in cutting an erythematous node, and guinea-pigs inoculated with scraps from this node developed severe local and general tuberculosis. A number of inaugural theses in France have supplied further testimony.

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    hot fomentations in, iv. 599
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    opium in, iv. 600
    phenacetin in, iv. 599
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    sodium sulphite in, iv. 599
    sodium thiosulphate in, iv. 599
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    fullers' earth in, iv. 592
    glycerin in, iv. 592
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    ice-cream in, iv. 614
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    potassium bromide in, iv. 614
    tannic acid in, iv. 614
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Esophagoscope, Jackson's, vi. 257
Esophagoscopy, vi. 243, 256

Esophagoscopy was found of service by Guisez (Bull. de l'Acad. de

Méd., Feb. 1, 1916) in 3 cases of cicatricial stenosis of the esophagus of traumatic origin. In 3 others esophageal spasm due to irritation of the vagus by an imbedded missile was found. The procedure was also useful for the localization of foreign bodies lodged beneath the wall of the esophagus.

cocaine in, iii. 489
Esophagus, iv. 600
carcinoma of, iv. 623

Carcinoma of the esophagus in a case reported by Guttman and Held (Med. Rec., June 10, 1916) gave practically no symptoms until a short period before death. A fistula between the esophagus and bronchus had existed for some time, food passing into the latter and finally causing bronchiectasis. This, in turn, caused small pulmonary hemorrhages and cough, thus simulating tuberculosis. There was absence of pain and comparative euphoria at a temperature of 101° and 102° F. (38.3° and 38.9° C.). Choking and coughing spells on attempting to drink are characteristic of esophagobronchial fistula.

Hot fluids, giving rise to chronic irritation, are deemed by W. Lerche (Surg., Gynec. and Obstet., July, 1916) the main predisposing cause of cancer of the esophagus and stomach. The favorite sites correspond exactly to those of cicatricial strictures.

ammonium valerate in, iv. 627
antipyrin in, iv. 627
atropine in, iv. 628
cocaine in, iv. 627
codeine hydrochloride in, iv. 627
diet in, iv. 627
dionine hydrochloride in, iv. 627
gavage in, v. 12
hydrogen dioxide in, iv. 627, 628
morphine in, iv. 627, 628
orthoform in, vii. 216
radium in, iv. 626, 627

By radium therapy Lewin (Therap. der Gegenwart, Mar., 1914) achieved great improvement in a number of cases of cancer of the esophagus. One patient, a woman of 54, was apparently cured by 15 exposures of 1 to 4 hours to 50, 80 or 100 milligrams of radium in the course of 4 weeks. The radium or mesothorium was placed in a platinum or gold filter and covered with a hard rubber cover, then fastened to a slender silk bougie and introduced by means of a hollow sound.

rectal feeding in, iv. 626
surgical removal of, iv. 625, 626
congenital dilatation of, iv. 600
narrowing of, iv. 600
occlusion of, iv. 600
diseases of, iv. 600
dilatation of, iv. 622

According to Shaw and Woo (Lancet, Dec. 2, 1916), cases of esophageal dilatation have too frequently been referred to as examples of cardiospasm. Histologically there is found no hypertrophy of the muscles of the cardia such as might be expected if spasm had occurred. The diagnosis is made with a bismuth meal. The condition is possibly due to exaggeration of the normal angulation at the cardia.

bismuth in, iv. 623
dilatation of cardia in, iv. 622, 623
galvanism in, iv. 623
nourishment in, iv. 623
resection of dilated portion in, iv. 622
rinsing out esophagus in, iv. 622, 623
sounds in, iv. 623
surgical removal of constricted area in, iv. 623
tannin in, iv. 623
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pressure, iv. 604
diet in, iv. 606
gastrostomy in, iv. 606
washing out of diverticulum in, iv. 606
traction, iv. 606
surgical removal in, iv. 606

In a new operation for esophageal diverticulum devised by Gaub and Jackson (Surg., Gynec. and Obstet., xxi, 52, 1915), an esophagoscopist assists the surgeon by pushing the diverticulum out into the external wound with the esophagoscope. The bottom of the pouch is then seized with forceps. The esophagoscope is next withdrawn from the pouch and inserted deeply into the subdiverticular esophagus. The surgeon then amputates the saccular redundancy. Time is thus saved in senile, feeble patients. A small diverticulum is easily found and accurate removal of just the proper amount of redundancy is facilitated. They use intratracheal insufflation ether anesthesia.

fistula of, iv. 600
foreign bodies in, iv. 606; vi. 245, 256

The advantage, in esophagoscopy, of aspirating out of the esophagus the mucus secreted under the irritation from a foreign body, is pointed out by F. Leegaard (Norsk. Mag. f. Laegevid., July, 1916). A water-jet-pump aspirating device answers the purpose. When there is danger of injuring the esophagus by drawing a foreign body up and out, it is better to let it slide down into the stomach. It can then be followed with the X-rays, and the abdominal surgeon can extract it if necessary, which is seldom the case.

  apomorphine emesis in, ii. 65
  bristle bougie in, iv. 610
  cocaine in, iv. 610
  endoscopic removal in, vi. 245, 256-259
  esophagotomy in, iv. 611
  gastrotomy in, iv. 610
  Guisez's dilating tube in, vi. 258
  Jackson's speculum in, vi. 247
  mashed potatoes in, iv. 610
  tracheotomy in, iv. 611
  vinegar in, iv. 610
inflammation of, see Esophagitis, iv. 612; also this Index.
injuries of, iv. 611
intubation of, vi. 259

Good results in esophageal stenosis are reported by Guisez (Presse méd., Jan. 31, 1914), from the introduction of special rubber tubes through the remaining narrow lumen. The tubes are 5 to 6 cm. long, with upper end funnel shaped and lower end pyramidal. After systematic irrigation of the dilated esophagus to reduce local inflammation, the throat is anesthetized with 5 per cent. cocaine solution, an esophagoscope introduced, cocaine and epinephrine applied to the stenosis, the remaining small channel cautiously dilated with bougies of increasing caliber—a bougie sometimes being left in several hours—and an intubation tube slightly smaller than the last bougie finally introduced after lubrication. A whalebone rod is used to extend the pyramidal extremity of the tube so that it will pass through the stricture, but expand again when it has gone beyond it. The procedure usually takes but a few minutes, and the patient at once can take sufficient liquid food. Five or 6 days later a broad tube is inserted, and later still broader ones until No. 28 or 30 is reached. Provided a dilatable channel still exists, all forms of stricture can be thus intubated. The tubes are borne indefinitely if cleansed from time to time.

malformations of, iv. 600
neuroses of, iv. 628
paralysis of, iv. 629
  arsenic in, iv. 630
  faradism in, iv. 630
  gavage in, v. 12
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  dietetic measures in, iv. 602
  dilatation by bougies in, iv. 602
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spasm of, iv. 628; vi. 259
  amyl nitrite in, iv. 629
  bromides in, iv. 629
  camphor in, iv. 629
  chloral in, iv. 629
  cocaine spray in, iv. 629
  emetics in, iv. 629
  esophageal sound in, iv. 629
  suggestion in, iv. 629
  zinc valerate in, iv. 629
stricture of, iv. 614

An instance of simulation of esophageal stenosis by extensive carcinosis

of the lesser curvature of the stomach is reported by A. E. Austin (Boston Med. and Surg. Jour., Jan. 13, 1916).

bougie in, 616, 619, 620, 621

An esophageal bougie is described by Einhorn (Med. Rec., May 6, 1916) provided with an opening to which an olive can be screwed and material aspirated; the instrument can thus be used either as a tube or bougie. A stilet can be placed in to facilitate its introduction, and, when removed, a syringe can be attached and the fluid contents aspirated. The insertion of a wire stiffens the tube slightly.

catheter in, iv. 621
electrolysis in, iv. 22, 616

Total **esophagoplasty** was resorted to by G. Axhausen (Berl. klin. Woch., Jan. 17, 1916) in a case of traumatic esophageal stricture. The procedure comprised a gastrostomy and an anastomosis between the small intestine and the upper part of the stomach. The intestine thus united was freed from all attachments save its blood-supply, and free end carried up toward the ensiform beneath the skin, the remaining intestine being reunited by lateral anastomosis. A tube was then made down the thorax over the sternum by rolling a strip of skin together so as to bring the epithelial surface inward. This was then covered by the skin from either side. Next the upper end of the esophagus was freed, brought forward and united to the artificial skin tube, which was in turn united to the tube made previously from intestine. In a few months the patient returned to his ordinary diet, and had no difficulty in swallowing any form of food.

esophagostomy in, iv. 621
esophagotomy in, iv. 620, 621
excision of stricture in, iv. 619
gastrostomy in, iv. 616, 619, 621
gastrotomy in, iv. 620, 621
mercurial inunctions in, iv. 619
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Esophagus, stricture of (*continued*).
silver nitrate in, viii. 137
sounds in, iv. 622
thiosinamine in, iv. 619; viii. 530
syphilis of.

Syphilitic esophagitis, according to U. J. Wile (Amer. Jour. Med. Sci., Aug., 1914), is not infrequent. Probably many cases dying supposedly with carcinoma are instances of death from syphilis. The treatment must be most energetic. **Mercury** and **iodide** proved of service. The esophagus should be carefully sounded after the antisyphilitic treatment, and the contraction, if any, gradually dilated.

tuberculosis, **lactic acid** in, vi. 243
wounds of.

Discussing wounds of the esophagus in war, Grober (Deut. med. Woch., Nov. 26, 1914) warns against attempts to remove foreign bodies mechanically except under endoscopy. The pain and distress can be meanwhile alleviated by sipping a solution of **cocaine**, a drop or so at a time, keeping well under the maximal dose, or 20 drops of 1 per cent. **morphine** solution in a tablespoonful of water. Endoscopy should also follow the least disturbance noted a few days after vomiting of a foreign body in the esophagus, or evacuation through the intestines. Gunshot and bayonet wounds of the esophagus show a marked tendency to spontaneous healing. In diverticulum, relief is often obtained with an **emetic**. One patient for years has taken an emetic every morning.

Esophoria, see Strabismus, viii. 401
Essential dropsies of childhood, ii. 208
paralysis of children, viii. 217
Estlaender's operation in empyema, iii. 189
in labial defects, viii. 439
Estivoautumnal fever, see Malarial Fever, vi. 477; also this Index.
Ether, iv. 630
Ether anesthesia, iv. 636

Administration.—An etherometer devised by Montgomery (Amer. Jour. of Obstet., July, 1915) is based on

principles similar to the valve in an automobile tire, which permits air to enter but none to escape. The other valve is an outlet valve to control the flow of anesthetic forced out by the air pressure. This valve is so adjusted that the number of drops a minute discharged from the container may be accurately controlled.

J. T. Gwathmey (Trans. Amer. Assoc. of Anes.; Jour. Amer. Med. Assoc., Aug. 12, 1916) found that if we heated ether and chloroform, we had an anesthetic almost as safe as nitrous oxide and oxygen.

McCarty and Davis (Annals of Surg., Mar., 1916), after investigations, conclude that the amount of heat required to warm ordinary ether vapor as used in anesthesia by the open or closed methods or by intralaryngeal or intratracheal insufflation to body temperature is so small as to be a negligible factor in lowering body temperature and in inducing shock in anesthetized patients. The warming of ether vapor, however administered, is accomplished in the mouth, pharynx, trachea and primary bronchi, and the anesthetic reaches the alveoli at body temperature. The quantity of ether required to produce and maintain anesthesia does not appear to be materially influenced by warming ether.

W. J. McCardie (Brit. Med. Jour., Apr. 21, 1917) states that a small quantity of chloroform added to ether, about 1 to 20, largely does away with the irritant effects of the latter upon the respiratory passages, makes anesthesia simpler in induction, and increases its safety by preventing the excessive depression of the chloroform and the excessive stimulation from ether.

aperient in, iv. 644
atropine in, ii. 452; iv. 639, 649-651
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blood-serum in, iv. 651
calcium chloride in, iv. 651
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Ether anesthesia (*continued*).
  copious drafts of hot water following, iv. 667
  epinephrin in, iv. 665
  ethyl chloride in, iv. 648
  glucose in, iv. 644, 650, 652
  hydrogen dioxide in, iv. 644
  hyoscine in, iv. 649, 650
  Klapp method in, iv. 645, 646
  levulose in, iv. 652
  lime in, iv. 651
  method of administration, iv. 644
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  nitrous oxide in, iv. 650, 651
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  omnopon in, iv. 649, 651
  orange oil in, iv. 651, 659
  oxygen in, iv. 650, 651; vii. 274
  peppermint oil in, iv. 651
  potassium permanganate in, iv. 644
  salicylic acid in, iv. 645
  saline solution in, iv. 650
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  strophanthus in, iv. 644
  sulphonal in, iv. 649
  thymol in, iv. 645
  trional in, iv. 649
  veronal in, iv. 648
closed method in, iv. 658

Bryant and Henderson (Jour. Amer. Med. Assoc., July 3, 1915) assert that the pallor and syncope of a too open method of giving ether are due to acapnia, while by a closed method with a fair amount of rebreathing an excessive loss of carbon dioxide is prevented, visceral tonus is maintained and the circulation kept good, as shown by the pink color of the skin. The Rovsing mask and bag afford a good method of controlling the rebreathing. By observing the *color of the skin* one can judge the condition of the circulation. The anesthetist should keep the color *a wholesome pink.*

collapse in, iv. 668
  artificial respiration in, iv. 669
  atropine in, iv. 670
  bandaging of limbs and abdomen in, iv. 670
  caffeine sodiobenzoate in, iv. 670.
  camphorated oil in, iv. 670
  cocaine in, iv. 670

Ether anesthesia, collapse in (*continued*).
  coffee infusion in, iii. 516; iv. 670
  digitalis in, iv. 670
  epinephrin in, iv. 670
  external heat in, iv. 670
  heart massage in, iii. 196; iv. 669
  oxygen inhalations in, iv. 655, 669
  raising the feet and lowering the head in, iv. 669
  Ringer's solution in, iv. 670
  saline solution in, iv. 670
  strychnine in, iv. 670; vii. 145
  venesection in, iv. 670
 intratracheal insufflation, iv. 679

Since the introduction of intratracheal anesthesia in 1909, it has been employed successfully in the Johns Hopkins clinic, according to C. H. Watts (Jour. Amer. Med. Assoc., Sept. 4, 1915), in all types of cases, but chiefly in operations about the head and neck and in the thorax and spinal canal. Pure air is brought directly into the larger bronchi, while the vitiated air is forced out by the returning air streams, and the dead space of the mouth, pharynx, larynx and trachea is eliminated. The anesthetist has been relieved almost entirely from the embarrassment due to cyanosis. The difference in the effect on the pulse is marked. With intratracheal anesthesia the average increase was 27 beats as against 47 with drop ether. He deems this method much safer than the drop ether method; the anesthesia is smoother, and it offers the most efficient means of artificial respiration.

 intravenous, iv. 686
 intubation, iv. 679
 late poisoning in, iv. 678
  glucose in, iv. 679
  saline transfusion in, iv. 679
  sodium bicarbonate solution clysters in, iv. 679
  sodium citrate in, iv. 679
  venesection in, iv. 679
 local, iv. 691
 open method in, iv. 652
 postanesthetic paralysis in, iv. 679
 rectal, iv. 690

The dose of ether for rectal anesthesia, according to W. M. Johnson (N. Y. Med. Jour., Oct. 28, 1916), depends upon the age and weight of the patient, about 1 ounce (30 c.c.) of *ether* being required for each 25 pounds of body weight. This may be lessened when paraldehyde is used. More than 6 ounces (180 c.c.) of a 75 per cent. oil-ether mixture should not be given to adults, regardless of weight. The ocular reflexes should never be abolished, and stertorous breathing should not be allowed to continue.

In ether-oil rectal anesthesia, Luke (Med. Rec., May 9, 1914) found it difficult to regulate the dose with accuracy. The patient may suffer from intestinal cramp. Induction may be so prolonged as to necessitate ether by the lungs. Respiratory depression may become marked, the muscles unduly relaxed and the pupils dilated. Recovery may be prolonged for many hours. There is a greater possibility of post-anesthetic toxemia. The advantages of the method are more apparent than real.

 renal complications of, iv. 677
  diuretics in, iv. 678
  morphine in, iv. 678
  oxygen in, iv. 678
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  Laborde's method in, iv. 662
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  dry-cupping over chest in, iv. 676
  nitroglycerin in, iv. 676
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  alcohol in, iv. 671
  ammonia fumes in, iv. 655, 672
  artificial respiration in, iv. 671, 672
  atropine sulphate in, iv. 672
  bandaging of limbs and abdomen in, iv. 671, 672
  camphor in, iv. 672
  cold water on face in, iv. 671, 672
  digitalis in, iv. 671, 672

Ether anesthesia, shock (*continued*).
  epinephrin in, iv. 671, 672
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  head lowered and feet raised in, iv. 671
  hot blankets in, iv. 672
  hot-water bottles in, iv. 672
  laryngotomy in, iv. 671
  lung inflation in, iv. 671
  morphine in, iv. 671
  pituitary extract in, iv. 671
  pneumatic suit of Crile in, iv. 671, 672
  saline solution in, iv. 671, 672
  strychnine in, iv. 671
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  transfusion of blood in, iv. 672
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Ether anesthesia, vomiting of (*continued*).
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  strychnine in, iv. 675
  vinegar in, iv. 674. 675
  water in abundance in, iv. 676
Ether pneumonia, iv. 676

W. E. Darnell (Amer. Jour. of Obstet., Mar., 1917) recalls that Rovsing has proved experimentally that the bronchi are not at all irritated by ether, which, indeed, was originally used as an inhalation remedy for certain lung diseases. Mikulicz, substituting chloroform for ether, observed an increase of post-operative pneumonia, while local anesthesia caused a still greater increase. After abdominal operations the close relationship of the pleural to the abdominal lymphatics seems to explain its production.

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Shambaugh (Jour. Amer. Med. Assoc., Dec. 23, 1916) describes a safe method of intervention in the ethmoid labyrinth. It consists of 3 steps: 1, the removal of the concha media; 2, breaking into the bulla with biting forceps; 3, removal of the anterior ethmoid cells by means of forceps which cut forward. The median part of the ethmoid is left in place until all of the cells have been removed. This serves as a protection against encroachment on the meatus nasi communis, the roof of which is the cribriform plate.

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Extensive, ragged shell wounds require special dressings, according to Savariaud (Presse méd., Jan. 27, 1916), and an anesthetic cannot be dispensed with when they are changed. He has found ethyl chloride best. The patient's eyes are protected with a pad of 4 or 5 thicknesses of gauze, and then a square of oiled silk laid over the head, large enough to cover the face, and tuck the 4 corners under the head. A small hole is made in it only large enough to admit the tip of the ethyl chloride tube. By spraying it gently, progressive and continuous anesthesia at the rate of 1 c.c. (16 minims) a minute is realized.

Carles and Charrier (Progrès méd., xlii, 478, 1915) find ethyl chloride anesthesia valuable even in operations of 45 minutes' duration. It is useful in military surgery because of the saving of time. There is seldom vomiting, and if any, it is very mild. It is valuable in shock, feeble pulse, etc. They have used it in 200 of 700 cases operated upon. Several cubic centimeters are given at first to obtain complete anesthesia; after that about 0.5 c.c. (8 minims) every 3 or 4 minutes. The 3 or 4 respirations of pure air when the mask is raised to give the ethyl chloride are generally sufficient to prevent asphyxia. Relaxation of the muscles is not so complete as with ether or chloroform.

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Ethylhydrocupreine.

Ethylhydrocupreine (optochin), introduced in 1913, is a valuable aid in pneumococcal infections of the eye, according to William Zentmayer (N. Y. Med. Jour., Feb. 24, 1917). It often acts as a specific in *pneumococcal ulcers of* the *cornea,* especially if the treatment is begun before active tissue destruction. The evidence as to its value in corneal and conjunctival diseases due to other organisms is as yet insufficient.

J. S. Wyler (Lancet-Clinic, Dec. 25, 1915) found that as recently mentioned by Grunert, ethylhydrocupreine hydrochloride is of value in *acute* and *mild subacute infections of* the *lachrymal sac.* In 2 cases, with long standing *itching* and *redness of* the *eye,* the writer obtained analogous results. In the first, much stringy mucus was being secreted, epinephrine and novocaine alone bringing but temporary relief. Instillation of 1 per cent. ethylhydrocupreine solution, every 2 hours, brought absolute and persistent comfort. In 3 cases of trachoma improvement took place under a 2 per cent. solution.

As to its *internal use,* one of the chief disadvantages of ethylhydrocupreine is its toxic side action. G. H. Oliver (Brit. Med. Jour., Apr. 22, 1916) had a patient who received a total of 120 grains (8 Gm.) of the drug in 5-grain (0.3 Gm.) doses at 3-hour intervals, with resulting blindness amounting to bare perception of light.

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L. Schreiber (Münch. med. Woch., lxii, 1620, 1915) recommends a careful examination in every case where a patient complains of the slightest eye symptoms. Even where there is no external evidence, a small foreign body may be lodged in the eye and lead to trouble later. An important point to determine is whether a wound is perforating. Decreased intraocular tension shows that it is; but even with normal tension there may be a very small perforating injury. If the eyeball is perforated a careful examination must be made for the foreign body. If there is hemorrhage into the anterior chamber or vitreous body, or cataract, a Roentgen examination is often the only resource. If it is of iron or steel it can be extracted with the giant magnet.

Copper and lead fragments soon cause a dangerous aseptic suppuration. If too small to be removed with forceps, one must wait until they are increased in size by exudate around them. Lead fragments may cause thickening and contraction of the vitreous body, which may result in detachment of the retina. In the anterior chamber they are relatively harmless. Fragments of stone may remain in the eye for years without doing damage if non-infected.

Lloyd Mills (Jour. Amer. Med. Assoc., Oct. 23, 1915) referring to observations in Austria, states that the most frequent type of bullet wound of the eye is that in which the anteroexternal wall of the orbit is shot away, the bulb being ruptured. In other cases, the bullet perforates the orbital cone, the globe is shattered by indirect violence, even if not directly touched; and if not ruptured, various injuries may occur in any combination. The injury to the bulb is seldom in direct line with the incidence of the blow, and more often at right angles to it. Shrapnel and shell explosions are the most frequent causes of unilateral blindness; and the small fragments produce all the types of perforating injuries. The common practice in such cases was **prompt enucleation.**

As regards foreign bodies in the eye, Ormond (Pract., May, 1916) has been struck by the almost entire absence of sympathetic ophthalmia, and has seen nothing of the insidious variety of iridocyclitis. Concussion blindness he regards as a neurosis, which, when recognized early, and the patient's mental condition is soothed and encouraged, does not develop into anything like the serious condition otherwise occurring. Many cases of interstitial keratitis have developed among the soldiers during the past 12 months. Cases of recurrent iritis have been seen, mostly associated with urethritis.

Darier (Bull de l'Acad. de Méd., Apr. 13, 1915) has noted a great increase in the number of eye wounds since the close fighting in trenches, the head being most exposed. First aid should be with a **soft bandage,** an injection of **morphine** if pain is severe, and, if there is much destruction of tissue, 2 or 3 doses of **antitetanus serum.**

Bahr (Münch. med. Woch., May 18, 1915) recommends painting all wounded tissues of the eyes with **tincture of iodine.** The eye is prepared with **cocaine** if possible. The edges of the wound and all prolapsed parts are dabbed with the iodine until dark brown. A layer of cotton is interposed before the lid is turned back, to protect it against the iodine. An eye thus treated does not require redressing for 2 or 3 days. The pain at first is severe, but the eye is usually saved from infection.

According to Zade (Münch. med. Woch., June 1, 1915), traumatic corneal erosions require disinfection at once with **boric acid salve** and a protecting **bandage.**

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Wounds of the face by war missiles often result in such loss of tissues that surgical repair seems at first almost impossible, according to H. Morestin (Bull. de l'Acad. de méd., Mar. 13, 1917). The actual loss of skin, however, is often slight, or even non-existent. Restoration of the lips and cheeks can be obtained with relative ease providing certain principles are followed. The first is a very careful excision of all scars. Efforts are made to find and dissect up all tongues of skin, which are then returned to their normal places, a result not to be expected immediately but secured by repeated attempts at restoration, if necessary. Sometimes a small flap autoplasty is required in addition; also transplantations of fat, cartilage, or bone.

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In most patients with traumatic section of the facial nerve under Moure's observation (Presse méd., Apr. 13, 1916) in the present war, the lower branches to the chin or lips were alone severed. Such patients were but little inconvenienced in speaking, or even masticating. Contusion or section of the upper branches was often accompanied by fistula of Steno's duct and ophthalmic disturbances demanding surgical correction. The salivary fistulas were nearly always overcome by preventing mastication for 3 or 4 weeks. In relieving paralysis the writer was uniformly successful in 3 cases upon merely excising, under local anesthesia, all the thick cicatricial tissue between the nerve ends.

According to Morestin (Presse méd., Jan. 20, 1916), when in cases of facial palsy nothing can be hoped for from nerve anastomosis, the appearance of the face can be markedly improved by surgically reducing the subcutaneous soft tissues on the affected side. This is done by excision of portions of tissue, and by tucking up the tissues and fixing them to the underlying hard framework by means of buried sutures. Reduction of the flaccid half of the face in this manner is such as to render the deformity unnoticeable.

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spasm.

G. M. Dorrance (Med. Rec., May 6, 1916) finding the prevailing methods of injecting the facial nerve for the relief of facial spasm inaccurate and dangerous, devised one in which it is impossible to hit the jugular vein, and which injects the nerve accurately at its foramen of exit.

The needle (trocar and stilet style) 10 cm. long, 4 mm. thick, and graded in centimeters, is inserted at the angle of the jaw (the skin having been painted with 5 per cent. tincture of **iodine** and anesthetized with **novocaine**), and directed backward and upward until the point impinges upon the base of the mastoid. The handle of the needle is elevated and the point depressed, feeling the way carefully down and pushing the point backward and inward until the needle finds its way into the stylomastoid foramen. The styloid process prevents the needle from proceeding too far inward. If blood flows upon removal of the stilet, one should withdraw, clean the needle, and puncture again. If no bleeding occurs, a few drops of **alcohol** are injected. Immediate facial paralysis occurs upon hitting the nerve. Two c.c. (32 minims) more of alcohol should then be injected. Pain is relieved by **hot compresses**. The eye should be protected with goggles and washed out with **boric acid** solution at least twice a day. The face should be massaged daily to prevent atrophy of muscles.

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J. E. Moore (Med. Rec., Feb. 5, 1916) recorded cases which showed that infection of the Fallopian tube may occur from the peritoneal end, usually as a result of appendicitis.

Danforth (Surg., Gynec. and Obstet., Mar., 1917) cites a personal

case and adduces data from literature indicating that infections of the tube through the blood are decidedly more common than is supposed.

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Our Associate Editor, E. E. Montgomery (N. Y. State Jour. of Med., July, 1916) advises that in early cases, particularly of gonococcic infection, the woman should be put to bed, and the vagina irrigated every 2 or 3 hours with 2 per cent. **phenol,** 1:4000 **bichloride of mercury,** or 30 minims (1.8 c.c.) of **Lugol's solution** to the pint (500 c.c.). These irrigations should be hot and the vulva kept covered between treatments with a pad moistened with 3 per cent. phenol or 20 per cent. alcohol solution. The bowels should be kept open, and an **abundance of water** given. If there is evidence of pelvic involvement, **ice-bags** should be continuously applied. On the subsidence of acute symptoms hot applications should be used to promote absorption. In addition it is well to cleanse the vagina through a speculum and paint it with **tincture of iodine** or a 2 per cent. solution of **silver nitrate.** It should then be packed with **iodoform gauze.** Pus in the pelvic cavity should be evacuated, if possible, through vaginal incision and drainage.

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Kröner (Arch. f. Gynäk., cv, Nu. 2, 1916), referring to 25 women with genital tuberculosis, for which he had operated from 15 months to over 4 years before, states that 2 had since died; 5 presented unsatisfactory objective signs, though feeling well, while 18 were practically cured, their earning capacity being restored. Differential diagnosis is deemed immaterial, as the clinical picture of chronic disease in the uterine adnexa always calls for a **laparotomy**. If adhesions contraindicate excision of the focus, intervention must be limited to **local medication** of the abdominal cavity. One should wait until the temperature is normal before operating.

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Febris colombensis.

G. A. Lurie (Lancet, Feb. 12, 1916) observed a case of this tropical disease in Serbia, in an Austrian who had been prisoner in Serbia since December, 1914, and who had never been in the tropics. The author warns that it is not limited to the tropics. The patient began feeling tired and feverish, the fever being subcontinuous. The temperature seldom exceeded 103° F. (39.4° C.), and lasted 5 weeks, terminating by lysis. There was no roseola, no spleen enlargement, no complication. The blood examination for the typhoid states proved negative while it agglutinated *B. colombensis.*

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S. G. Gant (Penna. Med. Jour., Dec., 1916) states that in fecal incontinence non-operative treatment is not reliable, but **tonics,** cold **astringent solutions, massage, vibration,** and **galvanism** may strengthen the sphincter. He has devised an operation which can be done under local anesthesia and requires only about 10 minutes. Among 17 cases reported the incontinence was completely or partially cured in 16. In deplorable cases where plastic operations fail an artificial anus is established.

Feeble-mindedness and idiocy, vii. 672, see also Idiocy, this Index.
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  nail punctures of.

Clark (Boston Med. and Surg. Jour., Apr. 12, 1917) asserts that *nail puncture wounds* of the sole of the foot seldom cause infection *if promptly treated,* when caused by clean nails projecting from a board. An effective method of sterilization is by injecting pure **tincture of iodine.**

  soldiers'; for treatment of special disorders, see also Pes Planus, vii. 225; Hallus Rigidus and Valgus, vii. 233 and other disorders of the feet. See the same also in this Index.

Prophylaxis.—H D. Corbusier (Military Surg., Nov., 1916) in a special study of the feet of a regiment of recruits, both in camp and on the march, discovered many crippling conditions. He urges that 2 or more months before going to camp a careful inspection of the feet should be made. Corns call for a change in the shape of the shoe. Painful or obliterated arches on standing, a tendency to a valgus position, badly shaped toes, ingrowing nails, and bunions and any tender or inflamed spots should be corrected by an orthopedic or general surgeon. He advises the recruit to wear the camp shoes at least a few hours each day before going to camp.

Basil Hughes (Brit. Med. Jour., Sept. 19, 1914) gives directions for the prevention of sore feet in army recruits. The service boots should be well softened with crude castor oil. **Marching, properly graduated,** is an excellent treatment for flat foot, coupled with **good food** and **physical drill.** To prevent sore feet the **socks** are to be **washed** every second day and thoroughly dried, preventing accumulation of stale sweat, a powerful irritant. The **feet** are **washed daily** with soap and cold water, dried, rubbed with **methylated spirit,** and then dusted over with **boric powder.** Before a march the socks are **soaped well and dusted** with **boric powder.**

Treatment.—R. Jones (Brit. Med. Jour., May 30, 1915), after prolonged military experience, notes that *flatfoot* is essentially an abduction and eversion of the fort part of the foot. Tenderness elicited on pressure on the inferior calcaneoscaphoid ligament just below the tubercle of the scaphoid is characteristic. Pain is often most acute in patients having a high arch.

Acute flatfoot may occur in recruits or in nurses returning to duty too soon after illness. **Rest** and **massage** are indicated during the acutely painful stage, no weight bearing being allowed. Thereafter **adduction** and **inversion** are indicated. The foot should be molded into position and fixed by **plaster of Paris** for 10 days. Then comes **exercise,** particularly inversion and toe movements. *Traumatic flatfoot* is similar, but produced by a sudden force, *e.g.,* a vehicle running over the foot.

In neglected cases of flatfoot, the foot should be wrenched to **break down all adhesions** and make it thoroughly pliable, and thus converted into an acute traumatic flatfoot, when the treatment already described should be applied. Flatfoot neglected for many years becomes an *"osseous flatfoot."* Such subjects cannot be made competent soldiers.

Flatfoot due to *spasms of the peroneus* occurs in early adolescence. It causes a springless gait, walking with the feet rigid and the toes pointing out. The inner border over the scaphoid appears thickened, and even angular. The pain is often acute and the feet may perspire abnormally. The patient is unable to invert his foot; when he attempts it the peronei become rigid. There is tenderness over the peronei along the outer border of the foot. The spasm may be overcome by distracting the attention whilst the foot is gently pressed in inversion, and then, while the peronei are quiescent, **suddenly inverting the foot** and holding it there. The patient must be anesthetized to relax all spasm, and about ¾ inch of each peroneus removed about 1½ inches above the malleolus. The foot must then be **fixed** for about 3 weeks, well inverted and adducted at the midtarsal joint, followed by the ordinary treatment for flatfoot.

Subacute flatfoot is characterized by pain only on unusual function. The patient will recover if the heels of his boots are crooked so as to deviate the weight on to the other side of the foot. **Exercises** and **hot and cold water alternately** are useful.

In *hammer-toe* the operation advised by Jones (Brit. Med. Jour., June 3, 1916) is a **wedge-shaped excision** removing the articular cartilage on both sides so as to ankylose the joint in extension. An oval piece of skin, including the usually present corn, is excised and the flexor tendon cut and the toe put up in extension on a little splint, to be worn for some weeks.

In *displacement of the little toe*, amputation is advised. A good-sized flap is necessary to overcome subsequent contracture.

Metatarsalgia is a painful disability associated with flattening of the transverse arch. Immediate relief can nearly always be given by a bar placed transversely across the sole of the shoe bringing the weight-bearing on the neck of the metatarsals. The inner side of the heel of the shoe should be raised ⅓ inch, and strapping placed around the transverse arch of the foot. In cases not responding, the head of the metatarsal, usually the fourth, should be removed.

swelling of.

This disorder, according to Müller (Med. Klinik, Oct. 11, 1914), is peculiar to soldiers obliged to march long distances. The X-rays have shown it to be a fracture or periostitis of a metatarsal bone. About 22.5 per 1000 of the troops develop this trouble each year, with or without trauma. It generally can be cured in 15 to 30 days; only about 0.5 per 1000 have any disturbance left, from pains or too exuberant callus. It may be confounded with acute articular rheumatism, flatfoot and inflammation in the joints, cellular tissue, tendon sheaths, or bursæ. Strapping with plaster is indicated, the strip being applied to the back of the foot.

In the opinion of M. Jansen (Zeitsch, f. orthop. Chir., xxxv, 8, 1915), the primary symptom of swelling of the foot in soldiers is spasm of the interossei, which causes all the others. The increased tension of the fluid leads to swelling of the soft parts and hydrops of the periosteum; traction of the muscles on the periosteum causes pain. Rest of the muscles is indicated. A plaster cast enveloping the calf and foot to the tips of the toes should be applied. Hot packs and hot foot baths relieve pain. After recovery a flatfoot plate should be applied.

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Dorrance (Annals of Surg., lxiv, 716, 1916) states that of his 47 recent cases, 40 were opened within the first 48 hours, and complete cure ensued. Of the other 7, 5 were done after 54 hours had elapsed. He makes an incision starting at the base of the nail on one side and extending in the line of the furrow over the tip of the finger, down on the other side to a point on a level with the beginning of the incision, in that way making a flap of the tip of the finger. If the procedure is done properly, loss of sensation in the tip of the finger never occurs, and the final result is practically a normal finger.

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According to Hymanson (Amer. Jour. of Obstet., Feb., 1916), the most satisfactory antipyretic in hyperpyrexia for young children is water. In giving a cold pack, cold bath, or cold colon irrigation, in order not to frighten a timid child, it is best to begin with a temperature of 95° F., and to lower it gradually by addition of cold water or ice down to 60° or 65° F. Gentle friction of the body and extremities must be carried out during the bath. At times the heart must be sustained with stimulants.

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Gordinier (Albany Med. Annals, July, 1916) states that auricular fibrillation is, next to extra-systole, the most common form of cardiac arrhythmia. Its most notable symptoms are: Tumultuous ventricular action and gross pulse irregularity; the systolic or ventricular type of jugular and liver pulse; a distinct deficit between the rate of the apex beat and that of the arterial pulse; the absence of the auricular wave in the phlebo-, cardio-, and electro- cardiogram; appearance in the diastolic period of the phlebo-, cardio-, and electro- cardiograms of wavelets of fibrillation, in the cases associated with mitral stenosis, disappearance of the presystolic murmur and thrill, and their reappearance when auricular activity is re-established. The prognosis is dependent upon the ability of the myocardium to respond to active digitalis therapy. The relief obtained from digitalis is often prompt, and lasts over prolonged periods.

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In some intestinal cases, according to Einhorn (Med. Rec., Mar. 18, 1916), there is true indigestion, especially of starchy food; this must be restricted. Where the proteins are poorly digested, they must be cut down, and salicylic acid or benzonaphthol may be administered. In meteorism it may be necessary to use the stomach or rectal tube. Atropine, grain 1/60 (0.001 Gm.) once or twice a day, is of great service, even in mechanical meteorism.

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Seelhorst (Münch. med. Woch., Oct. 12, 1915) states that in the daytime, open windows and doors attract flies, which at dusk tend to escape. Doors and windows should be screened, therefore, in the daytime.

A mixture of **sodium arsenite** 1 pound, **sugar** 10 pounds, water 10 gallons, sprayed on detached branches of trees with firm foliage, manure heaps, dunghills and garbage cans, old bags and the like, effectively destroys flies, according to Malley (So. African Jour. of Sci.; Med. Rec., Sept., 16, 1916).

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- Florence test for spermatic fluid, v. 395
- Fly-blisters, see Cantharides, iii. 9
- Folin's method in urea determination, viii. 673
- Follicular conjunctivitis, see Conjunctivitis, Follicular, iii. 556; also this Index.
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- Fomentations, viii. 814
- Food poisoning, viii. 570

The growing use of sea food, owing to the war, renders pertinent, from a hygienic standpoint, the method of the Japanese in marketing fish, recalled by D. L. Belding (N. E. Med. Gaz., Nov., 1916). The fish are brought alive in water to the consumer, who chooses one, which is killed and dressed immediately.

Blankenhorn, Harmon and Hanslik (Cleveland Med. Jour., Feb., 1916) refer to 80 instances of poisoning from creamed codfish among the help of the Lakeside Hospital.

A. W. Fairbanks (Boston Med. and Surg. Jour., Mar. 22, 1917) gives instances of food poisoning due to fish, in which an unknown toxin manifested a selective action on the nervous system. The fish, apparently in good condition when obtained, had been kept in a refrigerator 4 hours. The nervous phenomena occurred with striking uniformity 21 days after the onset of the gastric symptoms.

Bacteriological and feeding experiments by Bernstein and Fish (Jour. Amer. Med. Assoc., Jan. 15, 1916) demonstrated the presence of *Bacillus paratyphosus* B in specimens of pie eaten at a restaurant. The possibility that a carrier was responsible could not be proven. The occurrence points to the possibility that even cooked or baked foods may contain living pathogenic organisms.

Cumming and Chambers (Jour. Lab. and Clin. Med., i, 428, 1916) have found that Vaughan's protein poison could be prepared from tissue cells of the exsanguinated organs of multicellular animals. It is not only toxic for heterologous species, but also for homologous. It hastens the clotting of blood from the guinea-pig, rabbit, and dog *in vivo.* Protein poison prepared from casein, however, retards or prevents clotting of dog's blood.

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golfer's.

The term "golfer's foot" was applied by Cross (Med. Rec., May 20, 1916) to an acute foot condition from distortion resulting from a broken arch in the anterior metatarsal curved area. Its symptoms are discomfort at the base of the third and fourth toes, with tenderness and pain on flexion of the latter. If neglected, chronic broken anterior arch may result, or Morton's metatarsalgia. Treatment consists of correction of the distorted position of the metatarsal heads, their maintenance in proper position, a toning up of the supporting tissues and removal of inflammation. **Cork** and **rubber supports** should be used. **Dry heat** or **moist dressings** of a solution of **magnesium sulphate** covered with oiled silk may be of service.

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V. Maragliano (Riforma Medica, July 3, 1915) introduced a method whereby 1 radiograph shows the location and depth of a foreign body. Two squares of waxed cloth, in which are imbedded pieces of lead, one square and the other triangular, are prepared. One is placed on the side of the body nearest the X-ray plate, and the other on the far side. By comparing the plate with a pasteboard chart, the exact location is obtained.

Phocas (Arch. d'électr. méd., Nov., 1915) described a case in which a number of small shell splinters were extracted under the guidance of the Bergonié electro-vibreur (an electromagnet charged with alternating current, which sets up induced currents, and consequent vibration, in metal fragments within its field of influence).

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- disinfection.

S. G. Dixon (Jour. Amer. Med. Assoc., Sept. 19, 1914) states that sodium dichromate used with sulphuric acid, gives results like those of potassium permanganate. Formula: Sodium dichromate, 10 oz. (300 Gm.); saturated solution formaldehyde gas, 1 pint (500 c.c.); sulphuric acid, commercial, 1½ fluidounces (45 c.c.). The acid and gas form a stable solution. After it cools it should be poured over the crystals of sodium dichromate, spread out in a vessel having 10 times the volume of the ingredients. The process is more rapid than with permanganate.

F. Gand (Presse méd., Mar. 16, 1916) recommends for disinfection of clothing commercial formaldehyde, poured into a saturated solution of potassium permanganate. The mixture soon becomes hot and gives off abundant fumes which rapidly penetrate the clothing. The clothing may be placed in a large barrel, connected by a tube or pipe with a small barrel containing the mixture.

- poisoning, iv. 732

S. E. Earp (N. Y. Med. Jour., Aug. 26, 1916) reports 3 cases of poisoning. All recovered. The treatment consisted of a quart (liter) of milk by tube after the stomach lavage with diluted aromatic spirits of ammonia. Milk of magnesia and strychnine were also given.

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- water, copious internal use in, iv. 732

Formalin, iv. 730

Formic aldehyde, iv. 730

Formine, see Hexamethylenamine, v. 519

Formol, iv. 730

Foul odor in gangrene of lung, chloral hydrate in, iii. 212
- ulcers, see Ulcer, Foul, this Index.

Fourth disease, iv. 737

In an encampment of the Italian army in August and September, 1915, Montefusco (Riforma Medica, Feb. 21, 1916) reported 57 cases of this disease. The diagnosis was at first difficult.

- cleansing baths in, iv. 739
- diet in, iv. 739
- skin anointed with olive oil or cacao butter in, iv. 739
- -nerve paralysis, see Strabismus, viii. 400

Fowler's operation, iii. 188
- solution, see Arsenic, ii. 119
- technique in visceroptosis, v. 783

Fractures, iv. 739

Delbet (Rev. de chir., xxxiv, 249, 1915) emphasizes that the object of fracture treatment is not only reduction but early restoration of function. The Delbet method consists in using a metal extension apparatus applied at once, after which the patient is allowed to get up and walk. Extension is maintained by a hollow metal rod into which a solid one glides, like a curtain rod, with a spiral spring By driving pegs into suitable holes the apparatus can be made rigid at any desired length. The points of support are metal or plaster rings passed around the upper and lower ends of the fractured bone, leaving the joints free.

In fractures in and around joints E. F. Robinson (Jour. Mo. State Med. Assoc., Feb., 1916) advocates wire nails which are here superior to the Lane plate. They may be withdrawn in from 5 to 6 weeks, especially in children; their removal is not essential in adults.

Nail extension is considered indicated by Gerster (Med. Rec., July 1, 1916) in fractures of the lower extremity when the usual traction or plaster methods fail or cannot be employed, in badly compounded recent fractures with extensive abrasions and injury to the soft parts, and in old malunions with much shortening. Infection is prevented by avoiding the joint cavity or epiphyseal line. In 30 cases, the nail holes healed completely under wet dressings.

Where there is deformity or overriding, Lathrop (Annals of Surg., July, 1916) either puts in an Albee **sliding graft**, or puts the ends in position with clamps, and then fastens them, 2 holes being drilled through each fragment in such direction that, when **kangaroo tendons** are passed through, they cross each other in the medullary canal and hold the ends in appostion without slipping. In overlapping or oblique fractures, the holes are drilled straight through, the gut being passed in and out and tied as a mattress suture. Two of these are sufficient.

Oblique fractures, according to Lund (Surg., Gynec. and Obstet., Nov., 1916), are well treated by some form of **encircling wire** or **band**. The best is that of Parham and Martin. By using 2 bands, spiral fractures with comminution may be well managed. In children the bone grows over the band, and includes it.

baking with dry heat in, iv. 753
bone grafts in.

In using **inlay grafts** as a substitute for Lane plates in ununited and fresh fractures (especially comminuted fractures) Albee (Med. Rec., Mar. 20, 1915) uses a universal motor, with a small saw for deep cavities, such as laminectomies, his twin saw, and a device by which the distance between the saws can be adjusted. This outfit is not absolutely necessary. In favorable subjects the entire graft may retain its viability, the inlay method bringing together each of the 4 layers: periosteum, compact bone, endosteum, and marrow. The bone graft is still more efficacious in gunshot or other fractures where there is comminution or sequestration. In fresh fractures of large bones, to prevent the inlay from slipping into the marrow cavity, the graft and gutter beds are made wider at the periphery. With the fragments in proper alignment, the graft is usually removed from the fractured bone, generally the proximal fragment, and then slid distally into a groove one-half its length prepared for it in the distal fragment. In the femur the sliding inlay is made 5 or 6 inches long. In long bones with difficulty of fixation, the inlay is held by bone graft pegs or heavy kangaroo tendon, or both.

In a large percentage of cases of gunshot fractures of the arm in which C. H. Fagge (Pract., May, 1917) employed a bone graft, it seemed necessary also to introduce a plate, so arranged as to fix the intervening graft in its proper position.

cocaine anesthesia in, iii. 484, 496; iv. 748
electricity in, iv. 753
ether in, iv. 641, 642
infiltration anesthesia in, iii. 499
Lane's metal plates in, iv. 751

Lane (Pract., Mar., 1916) deems it rarely advisable in the septic conditions often met with in war practice, to fix the fragments with **plates.** In most cases one must wait until the wound has healed and the sepsis been reduced. In any case no operation need be done for the first 4 weeks. If operation seems necessary before a wound has been rendered clean or has healed, the screws should be inserted as far from the fracture as possible. Inoculation with an **autogenous** vaccine may be used. Exact apposition of the whole areas of the broken ends is not necessary. The sooner the patient is gotten up and about, the more bone will be deposited. Fragments of bone or callus should be saved, and employed to fill any interval. Much heavier steel plates are required than in the less comminuted fractures of civil life.

E. R. Secord (Canada Lancet, July, 1916) points out that while a reasonably expert operator can **plate** a broken femur in ½ hour, it will take him probably 2 hours to put in a bone graft. He has never had to remove a plate, and has never seen any irritation from it. No evidence has been seen in radiographs of rarefying osteitis or of loose, bent, or broken plates. Most failures are due to faulty methods, or to failure to understand what may be expected of any internal fixation. The bone graft has certain advantages, but the difficulty of application and retention more than counterbalances these.

lead and laudanum in, vi. 314
massage in, iv. 753
novocaine anesthesia in, vii. 106
novocaine-suprarenin in, iv. 748
passive motion in, iv. 753
plates, external in.

External plating in fracture cases is preferred to internal by H. R. Allen (Lancet-Clinic, cxiii, 430, 1915). Bone pins are used capable of drilling their own holes and provided with handles which later become the external plate. They are made of a low melting alloy which melts at 160° F., and when cool is sufficiently strong. The pins should be so placed that no 2 lie in the same plane.

sodium silicate dressing in, viii. 193
splints in, iv. 752
wiring of, iii. 484
Barton's, iv. 776
coccygeal, iv. 778
Colles's, iv. 774, 776

In a study of 444 cases of Colles's fracture, D. Dwight (Med. and Surg. Report of Roosevelt Hosp. N. Y., p. 85, 1915) found the most reliable symptoms to be a line of tenderness following and confined to the line of fracture, best elicited by making pressure with a lead pencil completely around the radius. Most cases were treated with a **circular plaster bandage**, from the elbow to the ends of the metacarpal bones. This was split along the ulnar margin when hard. The average period of immobilization was a little over 3 weeks.

massage in, iv. 776
compound, iv. 753

In compound fractures Depage and Vandervelde (Presse méd., Mar. 1, 1917) have been able regularly, after **Carrel treatment**, to close the wound in 2 to 4 weeks. Bacteriological examination is made every other day, and the wound sutured when 2 or 3 successive negative tests have been obtained, after freshening the margins and removing scar tissue.

In uninfected compound fractures Wainwright (Penna. Med. Jour., Feb., 1917) advises that all areas exposed to infection be made accessible. Then tubes and light gauze dressings must be so arranged that irrigations with **Dakin's solution**, either at intervals through a syringe or continuously through a Murphy drip apparatus, can be kept up. A good way is to put the tube or tubes into the deepest parts of the wound and bring them out through the gauze dressings and a sterile bandage. The latter is then surrounded by a sterile towel, pinned so that at intervals the nurse may unpin it and reach the tubes, thus kept in a sterile field. The gauze inside the wound must be lightly placed, with the sole purpose of holding the tubes. Gauze is of no value as a drain. All the dressings must be light, so that irrigation may really be effected.

balsam of Peru in, iv. 753
Bier's hyperemia in, v. 591
formalin-gelatin powder in, iv. 736
guaiacol in, iv. 753
iodine in, iv. 753; vi. 36, 37
delayed union in, **hypophosphites** in, vii. 450
lactophosphates in, vii. 450
thyroid gland in, i. 748, 751
depressed, blood-pressure in, ii. 493
gunshot.

Of 327 fractures treated by F. A. Coller (Boston Med. and Surg. Jour., Nov. 23, 1916) in the American Women's War Hospital, 40 were simple and 287 compound. Of the 287, in only 44 did healing take place without infection. Of the 243 infected cases, 238 were pyogenic infections. Usually the sepsis was of a low-grade nature, with tendency to become chronic, with indolent granulations and sinus formation. For drainage, rubber or gutta-percha strips were always used, with a soft rubber tube of small caliber for irrigation and for **Carrel and Dakin instillations. Bone-plates** are justifiable in a certain few septic open fractures, but they must be early removed. Conservative treatment of comminuted fragments is advised. Of the 243 infected fractures, 115 required operation for removal of sequestra. Vigorous curetting is condemned. Often primary union was obtained after excision of sinus, removal of sequestra, and sterilization of the cavity.

In gunshot fractures, according to E. W. Hey Groves (Brit. Med. Jour., July 15, 1916), every wound, except the clean through-and-through bullet wound, should be **disinfected** within 48 hours **by excision** and **removal of foreign bodies.** A week or 10 days after injury, disinfection seems hopeless, and a selective method must be adopted, leaving alone the cases in which infection is quiescent. An irregular temperature, local tenderness, a rising leucocyte count, and an infection by the streptococcus, B. pyocyaneus, coliform or gas-producing bacteria, all require immediate operation. Where it is not possible to open up deep pockets, a metal tube with a stylet terminating in a Y-shaped fork, is of value, being inserted to the bottom of the cavity, and the ribbon gauze pushed in by the stylet.

R. Lataste (Paris méd., Oct. 28, 1916) holds that in gunshot fractures and joint wounds, a simple **plaster apparatus,** made from a long sheet of tarlatan 8, 12, or 16 layers thick, impregnated with plaster and water and applied as a gutter splint, gives best results in most cases, being far superior to metallic gutters. The wound should be covered with a smooth, voluminous, but not too extensive dressing, and the plaster gutter applied over the dressing, with its edges turned back so as not to enclose more than half the circumference of the limb. For wounds near the *shoulder* the gutter is forked at its upper end; for the *lower extremity,* it projects beyond the toes; for the *knee,* an inverted L-shaped gutter is used. At each dressing a new plaster apparatus is required, but its production requires only a few minutes, and infrequency of wound dressing is a cardinal principle. If everything goes well without any redressing, he dispenses with it. The local and systemic conditions are constantly watched.

In gunshot fractures of the *femur* E. W. Hey Groves (Brit. Jour. of Surg., April., 1916) advocates immediate **immobilization** with a wire cradle sling splint constructed on the principle of the double inclined plane. After thorough opening and drainage by judicious transverse incisions, and when the wound has taken on a healthy character, **weight extension** should be applied. Results were as follows: Deaths, 10 per cent.; loss of limb, 6.6 per cent.; good form and function, 74 per cent.; delayed union, 16 per cent.; delayed healing, 6 per cent.; deformity, 4 per cent.

Plaster-of-Paris dressings are condemned by R. Jones (Brit. Med. Jour., Dec. 16, 1916) in the presence of open wounds, the plaster becoming offensive and adding to the infection. For fractures of the *lower spine* and *pelvis* he uses the **double Thomas** frame. Intra- and extra- capsular fractures of the *femur* are treated by a modified **Thomas splint** allowing of abduction. Extension is obtained by adhesive strapping and tapes secured to the lower part of the frame and counter-extension maintained by a smooth leather groin strap on the opposite side. The patient can be transported with both limbs parallel, and upon arrival the limb is abducted. For all other fractures of the *thigh* the Thomas knee-splint is best. Fractures of the middle and lower middle portions of the *humerus* are treated by the modified **Thomas**

knee-splint or a modified Thomas humerus extension splint.

intercondyloid, iv. 770
metacarpal, iv. 777
metatarsal, iv. 791
of acetabulum, iv. 779
of acromion, iv. 765
  Velpeau's dressing in, iv. 765
of ankle.

Attention has been called by F. J. Cotton (Jour. Amer. Med. Assoc., Jan. 23, 1915) to a hitherto inadequately described type of ankle fracture, in which there is a fracture of both malleoli with a splitting away of a wedge, large or small, from the back surface of the tibia at the joint, with dislocation up and back of the foot. Sometimes the internal malleolus is included with the tibial segment in 1 piece. The fracture of both malleoli frequently causes confusion with Pott's fracture. The writer has seen 53 of these fractures in 7 years. In fresh cases he reduces the dislocation by forward traction with the muscles relaxed in moderate plantar flexion; after reduction, plaster is applied with the foot in maximum dorsal flexion. No weight should be borne for 7 or 8 weeks. In old cases he operates, incising on the outer and inner sides, dividing both malleoli above the joint, loosening up the whole joint and, if necessary, cutting out a fresh joint surface on the forepart of the tibia for the astragalus.

of astragalus, iv. 791
of calcaneum, iv. 791

In os calcis fracture Wilson and Cotton (Annals of Surg., Oct., 1916) found the following treatment very satisfactory: Loosen the fracture by manipulation; pull the heel down with ice-tongs; free the joint motion between astragalus and calcis; push in the displaced bone under the external malleolus by slowly striking with a big mallet on the outer side of the foot, padding with felt to take the blow, and supporting the inner side of the foot on a sandbag. This causes impaction. Finally, put the foot up in plaster, with heel-cord slack, and avoiding direct pressure on the heel.

of carpal scaphoid, iv. 776
  baking in, iv. 777
  massage, iv. 777
of carpus, iv. 776
of clavicle, iv. 763

Luethi (Correspondenzbl. f. Schweizer Aerzte, Mar. 25, 1916) has the elbows flexed and carried back, and places a round stick of wood about 3 cm. in diameter behind the back, passing through the crook of each elbow. Pads are placed between elbows and stick, and the elbows secured with bandages. The stick can be removed in 12 or 14 days, and the arms moved freely.

  Moore's bandage in, iv. 765
  Sayre's dressing in, iv. 764
  Stimson's dressing in, iv. 765
  Velpeau's dressing in, iv. 765
of condyle, external, iv. 771
  internal, iv. 770
of coracoid process, iv. 765
of coronoid process, iv. 772
of costal cartilages, see Dislocations, iv. 308
of elbow, iv. 771
of epicondyle, external, iv. 770
  internal, iv. 770
of epitrochlea, iv. 770
of femur, iv. 779
  shaft of, iv. 784
  Hodgen's splint in, iv. 784

Bone-pegs cut from the tibia are recommended by F. H. Albee (Annals of Surg., lxii, 85, 1915) in ununited fracture of the neck of the femur. The leg is kept in abduction in a plaster spica from toes to axilla for 6 weeks, the wounds being dressed through windows in the case. A shorter spica is then worn 6 weeks longer.

In fracture of the femur J. H. Downey (So. Med. Jour., viii, 525, 1915) puts the leg in the double-inclined plane, brings the broken ends together by traction, then applies a cast, the limb being thus placed in a restful position, with relaxed muscles. The method is excellent in fractures of the neck in old people.

In thigh fractures with extensive shortening Ducuing and Utea (Lyon chir., xiii, 814, 1916) advise that where it is impossible to lengthen the injured limb, limbs of exactly equal length be obtained by **shortening the healthy limb.**

About 50 cases of fracture of the hip-joint, C. H. Lemon (St. Paul Med. Jour., xviii, 86, 1916) treated with uniform success. The fragments were approximated and held immovable from 2 to 4 months in a spica dressing. The writer believes in a proper use of the **Whitman method,** which will prevent failure in from 90 to 95 per cent. of cases.

Because the vessels of the median and lateral portions of the femoral neck barely anastomose, and a considerable portion of the middle of the neck is free of blood-vessels, Lang (Deut. Zeit. f. Chir., cxxxv, 101, 1916) believes that the Kocher method of **extirpation of the femoral head** is the only rational operative treatment of non-union of the neck.

of foot, iv. 791
of glenoid fossa, iv. 766
of great trochanter, iv. 783
  Hodgen's splint in, iv. 784
of humerus, iv. 766

A **splint** devised by **Borchgrevink** is recommended by Lyle (Annals of Surg., Sept., 1916) for spiral and oblique fractures of the humerus. It is simply a Y-shaped board, with a pulley at the lower end and a padded crutch for the axilla. Ordinary extension straps are applied to the arm and attached to a spreader below the elbow. Thence a cord passes over the pulley, and is attached to a doubled rubber tube by a wooden button. By shortening or lengthening it, the traction is adjusted. If pressure in the axilla should arise, it is relieved by passing a bandage over the crutch of the splint and around the perineum. The splint is efficient, can be applied with the joints in semiflexion, and works day and night.

of hyoid bone, iv. 763
of ilium, iv. 778
Fractures (*continued*).
of ischium, iv. 779
of jaw, lower, iv. 762

A *round patch on the chin and lower lip,* close to the median line, was found constantly anesthetic by Imbert (Paris méd., Jan. 20, 1917) in fracture of the lower jaw. The patch is over an inch in diameter, and is innervated by the end branch of the inferior dental nerve.

Of all mandibular splints, W. H. Dolamore (Brit. Jour. Surg., iii, 526, 1916) prefers the **metal-cap splint,** made of thin metal, pressed out to conform to the teeth from a cast taken with the fragments in good position. This cast is then cemented to the teeth. Two lateral processes project from the mouth, curving down to the sides of the jaw, and may be joined by a bandage passing under the chin. This splint allows the patient to eat, and is easily kept clean.

Eve (Pract., May, 1916) deems **bone transplantation** the ideal method for bridging over gaps in the mandible due to gunshot fractures. In severe comminuted fractures, care should be taken to preserve fragments of bone which may be viable. If they necrose, removal is effected later.

of larynx, iv. 763
of leg, iv. 788
of lower end of femur, iv. 785
of malar bones, iv. 761
of malleolus, external, iv, 791
of maxillary bones, superior, iv. 761
of nasal bones, iv. 761
of neck of femur, iv. 779
  Buck's extension in, iv. 782
  Hodgen's splint in, iv. 782
  massage in, iv. 781
  passive movements in, iv. 781
of olecranon, iv. 771
of patella, iv. 785

J. A. Wyeth (Jour. Amer. Med. Assoc., May 22, 1915) describes the following new method: The edges of the fragments are exposed by a transverse incision, the clot washed out, the frazzled edges of connective tissue stitched with very fine linen continuous suture, and the skin incision closed with running chromicized gut. The holding device is as follows: A strong quarter curved needle, threaded with extra large linen is carried across the lower border of the lower fragment, dipping greedily into the substance of the ligamentum patellæ. The points of entrance and exit should be about 1¼ inches apart and the thread ends left 8 inches long. The same maneuver is practised along the upper edge of the upper fragment. Two strips of sterile gauze are laid over the incision, and over these are tied, very firmly, the upper and lower ends of the opposing threads. A plaster cast is applied over all, from ankle to near the groin, and the patient kept in bed for a week with foot elevated. After this, crutches may be used. After 6 weeks the threads are removed, and slight passive motion made with the fragments strongly supported. The cast is readjusted, and this is repeated twice at 2 weeks intervals. There is no danger of ankylosis.

  massage in, iv. 787
of pelvis, iv. 778

In practically all cases of fracture of the pelvis, Coopernail (Med. Rec., Mar. 4, 1916) has noted in 1 to 3 days an ecchymosis of the perineum and scrotum in men, and of the perineum and labia in women.

of the penis, vii. 340
of pubes, iv. 778
of radius, iv. 771, 776
  baking in, iv. 772
  massage in, iv. 772, 773
  passive motion in, iv. 773
of radius, Barton's, iv. 776
of ribs, iii. 173; iv. 763
of sacrum, iv. 778
of scaphoid with dislocation of semilunar, iv. 777
of scapula, iv. 765

Fracture in the region of the neck of the scapula, according to Hitzrot and Bolling (Annals of Surg., lxiii, 215, 1916), may occur without any recognizable deformity. The clinical manifestations are insufficient for a positive diagnosis, and the X-ray is an essential factor. Immobilization of the arm by a Velpeau or similar bandage is sufficient treatment. By massage, baking, and careful after-treatment practically perfect function is obtained.

of skull, iv. 755; viii. 796

Having lost a couple of patients with encephalitis after apparently only slight scalp wounds, Témoin (Bull. et mém. Soc. de Chir. de Paris, xli, 1024, 1915) now opens up all scalp wounds freely, and examines the skull. If there is the slightest fissure of the external table, he trephines at once. Any clots or fragments are removed and a small drain left in. Of 33 patients with scalp wounds, 29 were thus found to have skull fractures. Of the 23 trephined immediately, all recovered; of the 5 not operated until brain symptoms developed. 4 died.

F. R. Barnes and M. A. Slocum (N. Y. Med. Jour., Feb. 12, 1916) state that of 8 cases of skull fracture in which lumbar puncture was not done, all but 1 ended fatally. Of 19 cases in which puncture was done, 18 recovered. It should be done in every severe head injury, both for diagnosis and treatment.

Stewart and Luckett (Arch. Radiol. and Electrotherap., xx, 150, 1915) emphasize the aid rendered by the X-rays in discovering and locating skull fractures.

  amaurosis from, i. 594
  decompression in, iv. 758
  hexamethylenamine, v. 530, 531
of sternum, iii. 173; iv. 763
  multiple punctures in, iii. 175
  thoracotomy in, iii. 175
of trachea, iv. 763
of ulna, iv. 771
  arthrotomy in, iv. 774
  excision of radial head in, iv. 774
  osteotomy in, iv. 774
of vertebræ, iv. 759

Fractures of the lumbar vertebral bodies and transverse processes, according to Hartwell (Amer. Jour. of Orthop. Surg., Feb., 1916), are not infrequent, though generally overlooked. They cause steady pain in the back, but not necessarily any neurologic symptoms. Localized tenderness over the spinous processes should always suggest fracture of the spine, and if there is also a disalignment of the processes, it is almost certain. The kyphosis caused by compression fractures is readily mistaken for bad posture. Treatment consists in prolonged fixation in **extension** or **bone grafting.**

boric acid in, iv. 760
electricity in, iv. 760
laminectomy in, iv. 761

In fracture of the spine N. Sharpe (Amer. Jour. Med. Sci., Dec., 1916) strongly advocates a **laminectomy** performed as soon as the immediate shock of the accident has subsided, with **opening** of the **dura** to remove all pressure at the time or subsequently upon the cord. Of 5 cases of cord suture, 4 were living several years later, while without suture no patient has lived 1 year. If the ends cannot be approximated, and the lesion is dorsolumbar, an attempt should be made to unite the roots above and below it.

massage in, iv. 760
mechanical treatment in, iv. 760
silver nitrate in, iv. 760
Pott's, iv. 789
subepicondylar, iv. 771
supracondylar, iv. 769
T-, iv. 770
ununited, **digitalis** in, iv. 157

M. Fränkel (Med. Klinik, Feb. 21, 1915) successfully applied small stimulating doses of **X-rays** in several old fractures that had refused to unite.

S. Bergel (Berl. klin. Woch., Jan. 10, 1916) uses **fibrin** prepared from horses' blood, an emulsion being made of about 10 c.c. (2½ drams) of salt solution and 0.3 Gm. (5 grains) of fibrin. This is injected under the periosteum and between the ends of the bones, which are then splinted. Sometimes the injections have to be repeated every 2, 3, or 4 weeks. Of 48 cases, 26 showed complete consolidation, 10 progressive consolidation, expected soon to be complete, and 12 some improvement.

In ununited fractures of the humerus M. S. Henderson (Annals of Surg., April, 1916) found **transplantation of bone** much the quickest way of obtaining a good result. The inlay method is that of choice.

Where a case of delayed union is first seen in the seventh or eighth week, R. Jones (Brit. Med. Jour., June 10, 1916) finds it necessary to do no more than make sure of good alignment, length, and circulation. In old cases of ununited fracture in the lower limb he recommends the percussion and damming **method of H. O. Thomas** which consists of breaking down the soft fibrous callus, turning the fractured ends toward the skin, and beating them with a mallet. **Extension** is then applied and a **Thomas knee-splint** adjusted. Two pieces of rubber tubing are tied around the limb, one 3 or 4 inches above the fracture, the other below. At first they are kept on 20 minutes each day, later on several hours at a time, tightly enough to cause considerable swelling and stasis. Weak union is diagnosed by tenderness at the site of fracture and by exuberant callus exudation.

Y-, iv. 770
Fragilitas ossium, ii. 569
calcium phosphate in, ii. 570
codliver oil in, ii. 570
Frambesia, see Yaws, viii. 830; also this Index.
Franck's operation for gastrostomy, i. 45
Freckles, see Lentigo, vi. 315; also this Index.
Freezing, iv. 791; vii. 785, see Frost-bite and Freezing, this Index.
local treatment by, or Cryotherapy, see Ether, Ethyl Chloride, Liquid Air, and, for Carbonic Acid Snow, Refrigeration.
Freud's psychanalysis, viii. 418
Friedel operation in varicose veins, viii. 799
Friedreich's ataxia, see Hereditary Ataxia, viii. 245

Friedreich's sign in pulmonary tuberculosis, viii. 602

Fröhlich's dystrophia adiposogenitalis, vii. 157, see also Pituitary Body, Diseases of, this Index.

syndrome, i. 298; vii. 157

Frontal sinus, diseases of, vii. 213; viii. 148, see also Sinus, Frontal, this Index.

Frost-bite and Freezing, iv. 791; vii. 785

Prophylaxis.—Men with a sluggish circulation in general should not, according to Galli (Policlinico, Jan. 2, 1916), be sent to the specially exposed posts. Fatigue tends to render the circulation sluggish. Hence the need of frequently relieving the men. **Hot coffee** is a powerful tonic for men at exposed points. Where not available, a pill of **caffeine** with extract of **strophanthus** might be given.

Vasomotor predisposition plays an important part in frost-bite. Neri (Riforma medica, xxxii, No. 51, 1916) suggests **thyroid gland** for the prevention and treatment of the earliest stages.

Treatment, iv. 791.—Writing from the Italian front, Silvestri (Gaz. degli Ospedali e della Clin., Dec. 17, 1916) notes that freezing of the first or second degree always heals spontaneously. Local measures relieve suffering, however, viz., **massage,** possibly some **sedative salve, movements,** and if needed, **scarification of blisters,** an **absorbing powder,** light dressing, and **raising the foot** for edema. The men should not be allowed to stay in bed during the day. In third degree freezing the limb should be raised, but not covered. **Calcium salts** are very useful, with or without **strychnine.** No antitetanus serum should be given in second and third degree cases.

Debat (Bull. de l'Acad. de Méd., Jan. 12, 1915) obtained remarkable results from **passive ischemia** in the prophylaxis and treatment of freezing injuries. In Jacquet's biokinetic method the vasoconstriction is counteracted by **massage** and **exercises,** the patient lying **on the back** and **raising the leg** perpendicularly, holding it there with the hands. The **toes and ankle** are **worked vigorously.** This is kept up for 5 minutes and repeated every hour. In the intervals the patient reclines with the foot slightly elevated.

As **ultraviolet rays** revive frost-bitten plant buds, Pougnet (Bull. de l'Acad. de Med., Jan. 5, 1915) exposed frozen extremities for 3 or 4 minutes every 2 hours to the rays from a quartz mercury lamp, with a current of 110 volts and 4 ampères, at a distance of 25 cm. No benefit was obtained in simple freezing, but when there was ulceration healing began by the third to the fifth day.

alcohol in, i. 534
benzoin tincture in, ii. 456
Bier's hyperemia in, v. 591, 592, 593

Ghirlanda (L'Ospedale Maggiore, Dec. 31, 1916) observed a case of severe frost-bite of both feet in which an excellent result was obtained after several months wth no other treatment than **Bier's hyperemia.** This method was then used in many other cases. All that is required is a wooden box, a zinc pipe, a spirit lamp, and a thermometer. The treatments last an hour and a half, at first at 80° to 100° C., later at 90° to 110° C.

brandy in, iv. 792
camphor, spirit of, in, iv. 792
copaiba in, iii. 641
free incisions in, iv. 792

Wittek and Bundschuh (Münch. med. Woch., Mar. 23, 1915) highly recommend Noesske's **incision** down **to the bone** at the tip of a finger or toe threatened with gangrene. This starts the capillary circulation anew, especially when supplemented by a suction bell.

hydrogen dioxide in, v. 573
ichthyol in, v. 639
iodine in, iv. 792
rubbing with ice-water or snow in, iv. 792

Recalling that freezing requires **rubbing with snow or cold cloths, and then wrapping in cotton** to allow the limbs to warm up in bed without artificial heat, Melchior (Berl. klin. Woch., Nov. 30, 1914) emphasizes the danger from artificial heat, even when the parts are not actually frozen. When gangrene threatens, the stasis may be arrested by **slitting the end of the finger or toe down to the bone.** When it has developed, the drying up can be hastened by **peeling off the epidermis.** Healing then proceeds much more rapidly, as the epidermis dams up the secretions, detritus, etc.

silver nitrate in, iv. 792
sodium bicarbonate in, viii. 189
warmth to parts in, iv. 792
See also Pernio, vii. 399, and this Index.
of the ears, iv. 712
trench—"trench foot."

Trench foot, according to Raymond and Parisot (Presse méd., Feb. 1, 1917), is in reality a mycotic infection. Among the African native troops they have observed generalized forms of septicemic type, with the mycelial organisms in the blood. At autopsy mycelia were found in various organs and inoculations of aseptically collected bile caused characteristic lesions in experimental animals. Prolonged standing in cold water evidently allows of penetration of the organisms from the ground into the tissues.

Cottet (Paris méd., Mar. 17, 1917) regards trench foot as a neuritis; both arms and legs may be affected. Those predisposed have various paresthesias. Up to the knee and elbow thermic and contact sensations are dull, as also pain sensation.

Prophylaxis.—Waller and Rideal (Jour. Royal Army Med. Corps, May, 1916) assert that in trench foot there are 3 actions of water: (1) loss of heat; (2) effusion of salts; (3) infusion of water into the skin. Fishermen, otter-hunters, and workers in paper manufactories, who have to stand in water, have similar symptoms. A salted ointment such as **salted lard** is suggested to protect the foot against water, together with salt as an antiseptic. Dry socks and waterproof trench boots, loosening of the puttees, etc., are important factors. Officers' spiral puttees contract 5 to 6 per cent. of their length when soaked in water.

Hughes (Brit. Med. Jour., May 20, 1916), for the prevention of trench feet, established the rule that every man should **rest with the feet up.** This, with proper shelter and food, abolished trench feet. Two factors predispose to it: (1) fatigue, (2) venous stagnation and consequent exudation into the tissues of the foot. He classifies the condition in 3 stages, viz., those of congestion, coagulation and gangrene.

Treatment.—F. McKelvey Bell (Can. Med. Assoc. Jour., Apr., 1916) recommends rest in the **recumbent position** for 2 to 3 weeks, with the **feet elevated,** and little or **no dressing or covering.** No walking. After the first tenderness disappears, gentle **massage** with **oil of wintergreen,** or **camphorated oil. Lead and opium** may be used in the red, inflamed type. Some paint the foot with **iodine** or **picric acid.** Opiates should be avoided unless absolutely necessary. He prefers 2 grains (0.12 Gm.) of **phenacetin** and 7 (0.45 Gm.) of **sodium salicylate** 3 times a day. Feet once affected are liable to a relapse on slight provocation.

W. Gordon (Brit. Med. Jour., Jan. 27, 1917) found **sodium salicylate** very effective for pain in trench foot.

In all the cases seen by J. G. Blackman (Brit. Med. Jour., June 10, 1916) the men confessed to being subjects of sweating feet. In addition to a daily foot bath and change of socks, he recommends painting the feet with 40 per cent. **formaldehyde solution;** a dusting powder of **French chalk** and **zinc oxide,** rubbed down with a few drops of formaldehyde and applied to the feet and inside the socks; and a **generous diet** with plenty of nitrogen.

G. G. Davis and J. J. Hilton (Jour. Amer. Med. Assoc., June 17, 1916), observing tetanus in a case of trench foot terminating fatally, consider that all cases of trench feet should be given a prophylactic dose of **antitetanic serum.**

Subcutaneous injection of **oxygen** is recommended for trench foot by H. Oswald Smith (Brit. Med. Jour., Apr. 21, 1917) in the edematous or gangrenous types. An ordinary salvarsan needle is used, the oxygen washed through a saturated solution of sodium carbonate, being injected slowly into the subcutaneous tissues in the region of each malleolus and at the base of the toes in the middle line until the part is well distended. The needle should always be inserted through healthy tissue, perfectly sterile. The foot is then dressed with 1 per cent. solution of **picric acid,** changed as needed. Blisters should be drained by passing through them a single strand of sterilized thread. The *dead skin* should be left.

No remedy, according to W. J. Turrell (Pract., Jan., 19116) affords more immediate or lasting relief to the pain than **diathermy.** Only a small amount of current is used, causing a marked decrease in the swelling. When there is much swelling, with numbness, ecchymosis, induration, or ulceration, the **static breeze** current is most effective.

Fulguration, iv. 428
Functional disorders of nerves, vi. 800
  hypoadrenia, i. 456
  neuroses, **oxygen baths** in, vii. 275
Fungous growths, **acetic acid** in, i. 230
  hematodes, **chromium** in, iii. 337
Fungus, **Bier's hyperemia** in, v. 593
  cerebri, see Hernia Cerebri, v. 171; also this Index.
Furuncle, viii. 165

J. T. Bowen (Boston Med. and Surg. Jour., Jan. 18, 1917) aims to keep the skin sterile. A hot bath is taken morning and night, scrubbing the whole body, including the head, with soap, then dried, and the whole surface again bathed, but with a saturated solution of **boric acid** in water, and a small proportion of **camphor water.** The skin having dried, the furuncles are then treated with the following ointment spread on cotton or linen:—

℞ *Boric acid,*
Precipitated sulphur ...of each 4 Gm. (1 dram).
Carbolated petrolatum .... 32 Gm. (1 ounce).

This is repeated morning and night. Every stitch of linen worn next the skin should be changed daily, and in extensive furunculosis also all the contact bed-clothing and the night-clothing.

alcohol in, i. 532
ammonia, strong, in, viii. 165
amyloform in, i. 623
antiseptic injections in, viii. 165
aristol in, ii. 118
arsenic in, viii. 165
belladonna ointment in, ii. 444
Bier's hyperemia in, v. 591, 593, 594, 596, 597; vi. 53
boric acid in, viii. 165
boroglyceride in, vi. 37
calcium lactate in, 717, 718
  phosphate in, vii. 450
sulphide in, viii. 430
calx sulphurata in, viii. 165
camphor (spirit of) in, ii. 733
cataplasma kaolini in, vi. 176
caustic potash in, viii. 165
chloral hydrate in, iii. 212
cocaine in, iii. 491
collargol ointment in, iii. 534
collodion in, iii. 536
diet regulation in, viii. 165
ergot in, iv. 572
ethyl bromide in, iv. 694
europhen in, iv. 709
flaxseed poultice in, vi. 365
glycerin in, v. 31
guaiacol in, v. 148
heat in, viii. 165
hot air in, viii. 165
hydrochloric acid in, v. 557
hydrogen dioxide in, v. 573
ichthyol in, v. 639; vi. 37; viii. 165
iodine (nascent) in, vi. 44, 53
iodine tincture in, vi. 37, 42
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light therapy in, vi. 360
liquid air in, iii. 531; vii. 786
magnesium sulphate in, vi. 476
mercuric succinimide in, vi. 682

- Furuncle (*continued*).
        - mercury bichloride compresses in, vi. 681
        - mercury nitrate in, vi. 674; viii. 165
        - mineral acids in, viii. 165
        - naphthol camphor in, vi. 787
        - novocaine injections in, vii. 105
        - nuclein in, viii. 165
        - open-air exercise in, viii. 165
        - oxygen in, vii. 275
        - petroleum in, vii. 413
        - phenol in, vii. 444
        - potassium chlorate in, vii. 583
        - potassium hydroxide in, vii. 576
        - potassium-mercuric iodide in, vii. 584
        - quinine in, viii. 165
        - removal of cause in, viii. 165
        - salicylic acid ointment in, viii. 165
        - silver nitrate in, viii. 136, 137
        - sodium sulphite in, viii. 165
        - sodium thiosulphate in, viii. 165
        - staphylococcus vaccine in, ii. 364
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        - yeast in, viii. 165
    - chronic, staphylococcus vaccine in, ii. 363
    - in diabetes, see Diabetes Mellitus, Carbuncles and Furuncles in, iv. 37; also this Index.
    - of the ear, see Ear, Furuncles of, iv. 714; also this Index.
- Furunculosis, see Furuncle, viii. 165; also this Index.
- Fusiform aneurism, i. 666

- Gadberry's mixture, iii. 350
- Galabin's operation, vii. 648
- Galactocele, vi. 548
- Galactorrhea or excessive lactation, vi. 572
- Gall-bladder disease, vi. 424

Diagnosis.—M. E. Rehfuss (Penna. Med. Jour., Dec., 1916) states that modern methods for the study of gall-bladder disease include 3 of importance: (1) Study of the blood-serum for its cholesterol content, most cases of cholelithiasis showing an increase, indicating that a cholesterol-low diet should be instituted; (2) duodenal intubation, giving direct evidence of infection and information as to pancreatic function; (3) microchemical examination of the feces to discern disturbances in bile elimination and fat indigestion, usually met with in gall-bladder disease.

Einhorn (Jour. Amer. Med. Assoc., June 17, 1916) has identified probable cholecystitis by direct examination of the bile drawn with the duodenal tube in 40 cases. Usually where turbid bile is found in the duodenum in the fasting condition, cholecystitis with gall-stones exists.

M. G. Wohl (N. Y. Med. Jour., Feb. 24, 1917), found that in the presence of symptoms of gall-bladder disease, diminution or absence of free hydrochloric acid will not exclude the gall-bladder as the source of the symptoms, but rather strengthen the clinical diagnosis. The gall-bladder is not a functionless reservoir of bile, but is related in some way to the gastric secretion.

Pathology.—C. H. Mayo (N. Y. Med. Jour., Mar. 4, 1916), analyzing 6000 cases, regards gall-bladder disease as due to infection, acute, chronic or recurring. Bacteria are found in the walls of the organ, which is often thickened and whitened. Peritonitis followed by extensive adhesions is frequent. Stones may accompany the infection. Direct extension of organisms from the bowel is unlikely, normal mucous membrane being highly resistant to infection. It is through the blood- or lymph-streams that infection probably occurs, the primary focus being anywhere, the appendix or mouth, etc. The bacteremia of typhoid is a common source. Gall-bladder disease may simulate duodenal ulcer, having the same tendency to recur, but the pain bears less relation to the taking of food.

Treatment, vi. 428.—C. H. Mayo (N. Y. Med. Jour., Mar. 4, 1916) states that while milder cases may be relieved or cured by medical means, severe cases usually demand operation. When the infection has subsided, or is being maintained by stones, **cholecystotomy** may cure. When an active infection is present **cholecystectomy** must be done to get permanent relief. From letters of inquiry sent to cholecystectomy patients—none more recent than 1 year—219 replies were received, showing 71 per cent. cured, 22 per cent. improved, and 7 per cent. not improved.

Fowler (Amer. Jour. Med. Sci., Apr., 1917) holds that **cholecystectomy** is indicated in all gall-bladder diseases, whether causing mild or severe symptoms.

J. B. Deaver (Surg., Gynec. and Obstet., from Annals of Surg., lxii, 415, 1916) employs the following operation for removing the gall-bladder. The gall-bladder and right border of the gastrohepatic omentum are first freed. If there are adhesions, the region is well walled off. The edge of the liver and the fundus of the gall-bladder are grasped with the left hand, carrying moist gauze, and are pulled downward, outward, and then upward, making the cystic duct and free border of the gastrohepatic omentum taut. A small incision is made through the upper part of the border of this omentum, and the duct exposed. It may now be clamped at its junction with the gall-bladder, and cut across distal to the clamp with the cautery. The common duct is now explored with a probe. The cystic artery is next clamped and cut. If it is not necessary to drain the common duct, the stump of the cystic is ligated and next the cystic artery.

The gall-bladder is freed from below upward. This is done step by step, following closely with a continuous suture of catgut which passes through the liver tissue forming the gall-bladder bed. In this way, the operation is bloodless. The divided layers of the gastrohepatic omentum are sutured, not covering in the stump of the cystic duct. A small rubber tube is placed just beyond the free border of the gastrohepatic omentum, and left for four or five days. Should the stump of the cystic duct leak bile, the tube may be left longer.

acute empyema of, see Cholecystitis, Acute Infectious, vi. 431; also this Index.

Gall-bladder disease (*continued*).
cancer, vi. 433
  calcium chloride in, vi. 435
  cholecystectomy in, vi. 434
  cholecystostomy in, vi. 435
foreign bodies in.

F. Neugebauer (Zentralbl. f. Chir., No. 24, 1916), referring to a case in which an insect was found in the gall-bladder, remarks that the migration of foreign bodies from the intestine into the gall-bladder has occasionally been reported. Evidently minute particles of intestinal contents may reach the bile passages.

infection, **hexamethylenamine** in, v. 527, 528

inflammation of bile passages and, see Cholangitis and Cholecystitis, vi. 424; also this Index.

lesions of, in abdominal injuries, diagnosis, i. 114

occlusion of.

A personal study of congenital obliteration of bile ducts, and a study of those recorded, led Holmes (Amer. Jour. Dis. of Child., June, 1916) to conclude that when icterus in the newborn lasts more than 2 weeks with increasing intensity, obstruction should be suspected. After a month, if sepsis and syphilis can be excluded, obstruction is probable. Exploratory **laparotomy** should be performed as soon as the diagnosis is reasonably certain. In 16 per cent. of reported cases, operative relief was anatomically possible. When it cannot be done, an **external outlet** for the bile should be provided. Repair may be attempted. Meanwhile nutrition should be maintained with **bile** or **bile salts**.

perforation of.

A case of extraperitoneal perforation of the gall-bladder was observed by Hörhammer (Münch. med. Woch., Oct. 10, 1916) in a woman of 38 years. For 6 years she had had occasional pains on the right side and at the costal arch. Six months before, the right side had swollen gradually until a large tumor protruded. An incision in the posterior sheath of the rectus showed that cholecystitis had perforated into the abdominal wall, with escape of numerous gall-stones. This was removed and the abscess cavity closed. The incision was then enlarged and the gall-bladder removed. Finally, the abscess cavity was reopened, curetted and tamponed with iodoform gauze. Uneventful recovery followed. The author states that the gall-bladder contents have been known to slip down into the groin or thigh.

In an instance of perforation at the juncture of the cystic and common ducts, Lapenta (Surg., Gynec. and Obstet., May, 1915) based his diagnosis upon the peculiar coma the patient exhibited. The patient was found unconscious, temperature 94.8° F. (34.8° C.), pulse 120, and respiration 40. Breathing was entirely thoracic. Very slight palpation in the region of the epigastrium quickly aroused the patient, causing unbearable pain. A perforation about 7 or 8 mm. in length was found below the juncture of the common duct, a calculus protruding from the rent.

  tumors, vi. 432, 435
Gall-stones, see Cholelithiasis, iii. 275; also this Index.
Gallant's rest cure in visceroptosis, v. 781
Gallic acid, iv. 792
Galloping consumption, viii. 596
Galton's whistle, v. 688
Galvanic currents, see Electrotherapeutics, iv. 415
  test for labyrinthine lesions, v. 685
Galvanocautery, iv. 422
Galvanometer, Einthoven string, v. 318
Gambir, iv. 793
Ganglia, sympathetic, viii. 510
  excision in, viii. 510
  incision, subcutaneous, in, viii. 510
  iodine in, viii. 510
  iodoform gauze in, viii. 510
Ganglion, gasserian, removal of, viii. 265
  ethyl chloride local anesthesia in removal of, iv. 699
Gangosa, salvarsan in, iv. 222

Gangosa, or rhinopharyngitis mutilans, according to A. Breinl (Annals of Trop. Med. and Parasit., June, 1915), is due to small bodies resembling yeast cells he found in the edema fluid of several cases. He believes that these cellular parasites belong to the genus Cryptococcus of the family Saccharomycetes. He terms the organism *Cryptococcus mutilans.*

Gangrene, iv. 793

Diagnosis, iv. 793.—Rigidity in the muscles after an injury of the limb is a warning of impending gangrene to which Prat (Paris méd., Mar. 31, 1917) calls attention. Fievez reports several cases in which *hardness of the leg below traumatic injury* persisted until gangrene developed. It is evidently a sign of ischemia due to vascular injury.

Etiology, iv. 797.—In a case reported by Balzer and Moulard (Bull. de l'Acad. de méd., May 2, 1916), a healthy adult of 51 years acquired, after vaccination, a phagedenic ulcerative gangrene of the arm, ultimately invading the anterior thorax down to the second rib and the entire back and nuchal region, ending in death.

E. B. Gunson (Brit. Jour. of Child. Dis., Aug., 1916) observed a case of gangrene of the leg following *diphtheria.* On the 22d day, dry gangrene of the right small toe had developed.

Gangrene of the uterus following criminal abortion is emphasized by Mauclaire (Ann. de gynéc. et d'obstét., xlii, 193, 1916). Serious trouble may follow the introduction of irritating solutions or unclean instruments, owing to gangrene of the wall of the fundus, a small perforation, etc. He cites 4 such cases.

A case of gangrene of the right foot and leg following septic abortion due to a mixed infection of *B. aerogenes capsulatus,* streptococcus and a diplococcus, starting as a thrombophlebitis of the right broad ligament, and involving the inferior vena cava, was observed and reported by Knipe (Amer. Jour. of Obstet., June, 1917).

Treatment, iv. 799
acetozone in, i. 243
alcoholic stimulants in, iv. 802

Amputation was considered necessary by Ivens (Med. Press and Cir., Jan. 3, 1917) in advanced cases of gangrene, and was performed 65 times out of 464 cases, with 48 recoveries, using the open method, with lateral incisions. In gangrene limited to groups of muscles or joints, **excision** was performed 41 times, with 33 recoveries. **Hypertonic salt** treatment **combined with 2.5 per cent. phenol** gave good results.

arteriovenous anastomosis in, iv. 801
Bier's hyperemia in, v. 591
camphor-oil dressing in, iv. 800
charcoal in, iii. 122
diet in, iv. 802

Extensive and deep shell wounds of the forearm observed by Fiessinger and Moiroud (Paris méd., Sept. 16, 1916) were found to contain gangrenous, both aerobic and anaerobic, germs. Under continuous moistening with Dakin's fluid the dead tissues melted off, no slough forming. The main property of the **Dakin fluid** is this chemical detergent action. A 5 per cent. solution of sodium chloride checks the dissolving action of hypochlorites. Applied around the wound it prevents caustic action.

elevation of part in, iv. 799
hematoxylon extract in, v. 394
hot air in, iv. 799, 800

In inoperable peripheral gangrene, W. Gilman Thompson (Med. Rec., Dec. 23, 1916) strongly recommends **dry hot air** to relieve pain and stench and mummify the tissues. Air heated to about 150° F. may be directed through a small stove pipe from a Bunsen burner to the part. Or, an electric toaster can be made to furnish the heat while an electric fan directs the air toward the tissues.

W. Meyer (Annals of Surg., lxiii, 280, 1916), in gangrene of the extremities due to thromboangiitis obliterans, advocates **superheated air,** or **Bier's hyperemia,** combined with systematic **hypodermoclysis** of Ringer's solution. If these fail, conservative operations are indicated, viz., **tying of the femoral vein or arteriovenous anastomosis.** Systematic **hypodermic injection** of 400 to 500 c.c. of Ringer's solution (Matesima-Koga) daily, or every second or third day, gives lasting or temporary results, but if temporary, repetition usually again brings improvement. Internally, **ductless gland** preparations deserve a careful test.

hydrogen dioxide in, iv. 800
hypodermoclysis in, iv, 799, 802
incision in cyanosed area in, iv. 800
massage in, iv. 799
Noesske's method in, iv. 800
oxygen in, vii. 275
passive hyperemia in, iv. 800
potassium bitartrate in, vii. 579
potassium permanganate in, iv. 800; vi. 574
quinine lygosinate in, iii. 391
saline solution in, iv. 802
slight flexion of extremity affected in, iv. 799
strychnine in, iv. 802
suction apparatus in, iv. 800
sulphuric acid in, viii. 432
superheated air in, iv. 799, 800
thermocautery in, iv. 800
turpentine oil in, viii. 634
warmth in, iv. 799
acute, **iodine after thermocautery** in, vi. 38
  potassium permanganate in, vi. 574
carbolic acid, iv. 796
diabetic, see Diabetes Mellitus, Gangrene in, iv. 37, 795, 802; also this Index.
dry, iv. 794
ergot, iv. 795
foudroyante, iv. 798
fulminating, **guaiacol** in, v. 148
gas-.

Symptoms.—The gas bacillus infection symptoms are as follows, according to Fauntleroy (Annals of Surg., Jan., 1916) : After 2 to 5 days there is swelling, with gas in the tissues and induration of the skin; a brownish discoloration is noted, and a fetid odor is characteristic of the serosanguinous discharge from the wound. More or less suddenly, vesicles appear varying in size from a pea to several inches. The pulse distal to the wound becomes weaker and in the last stage is absent. The fluid in the vesicles rarely contains the organism. Injuries predisposing to gas infection are usually associated with shock and sapremia, and in 10 to 30 hours the specific invasion causes a rise of temperature of 1 or 2°, rise in pulse-rate, headache, malaise, anorexia, and thirst. The second stage is marked by progressive gas formation, circulatory disturbances, and increased virulence. The pulse-rate increases out of proportion to the temperature, which may reach 104° or 105° F. (40° or 40.6° C.). The discharge increases, the part swells, crackling is marked, there is mottling of the skin, and the patients passes into a fitful coma heralding the final grade, septicemia. There is then a falling temperature curve and rising pulse-rate.

Incidence.—G. Gross (Bull de l'Acad. de méd., Paris, lxxvi, 586, 1916) states that out of the 2796 severely wounded men received in his ambulance during the battle of Verdun, there were 101 cases of diffuse, massive, gas gangrene, 92 due to shell wounds. Leg injuries were those oftenest complicated by gangrenous septicemia. Vascular lesions play an important rôle. The results were 44 recoveries and 57 deaths, after either amputation, disarticulation, or a wide opening up, with ether treatment. Among those operated within 12 hours the mortality was only 4.8 per cent..; in those after 36 hours, 26.88 per cent.

Diagnosis.—Lapeyre (Presse méd., p. 431, 1916) divides gas infections of war injuries into (1) *Gaseous septicemia,* appearing very early, with local and general disturbances, and a rapidly fatal course. There is no true clinical gangrene, and death usually occurs in 30 to 50 hours. (2) *Gaseous gangrene,* less grave, yields to surgical treatment. It seldom appears before the third day. The signs are edema, fetid gas, and sphacelated areas about the wound or in the whole limb segment. This form may be gaseous, edematous, or gangrenous according to the predominating symptom. Early amputation is the only treatment for established cases. (3) *Local gas infections* may show an early appearance of gas about a wound, with no tendency to diffuse and no general reaction. The usual wound cleaning and drainage generally suffices.

For the diagnosis of incipient gas gangrene, Biermann (Münch. med. Woch., Oct. 31, 1916) strikes the region with the thinnest pincers available, held like a tuning-fork. When there is gas, even in the depths of the muscle, there is a *dull note* like the "cracked-pot sound." The exact area involved can be thus outlined.

H. Black (Brit. Med. Jour., Jan. 6, 1917) found the X-rays of diagnostic advantage in the less malignant forms of gas infection. The gas shows as areas of lessened density varying in size from 1.5 to 3 cm.

H. M. Berry (Proc. Roy. Soc. Med., x, Sect. Electro-Therap., 17, 1916) notes that in all cases of diffuse gas infiltration shown by the X-rays crepitation of the tissues could be felt. Where only a few discrete gas bubbles were shown, nothing abnormal was palpable.

Etiology.—In 460 cases of gas infection studied by M. H. F. Ivens (Med. Press and Cir., Jan. 13, 1917), of which 107 were clinically gas gangrene, the leading etiological factors were as follows: Proximity to contaminated soil; wounds of the lower limb showed a mortality 3 times as great as those of the upper, though the latter were more frequent; shell wounds were 6 times as frequent in gas gangrene as in ordinary infected wounds; the presence of an infected fragment of greatcoat kept up the infection. Early wound treatment is most important in the prophylaxis. Sixty per cent. of gas infected cases had fractures, and 71 per cent. of gas gangrene cases. Deep wounds of the calf, trunk, or hip-joint were especially dangerous. Tissue injury had an important influence, and intramuscular tension from within or without was a potent aid to the production of gangrene. The flora of gas gangrene was found usually multiple in 464 cases. *B. perfringens* was present in nearly every case; *B. sporogens* in 41; *vibrion septique* in 6 (several fatal); *B. histolyticus, B. Hibler* IX, and *B. edematiens* were all reported, less frequently. Streptococci of a virulent type were present in 59 cases, and added to the gravity of the infection. Tetanus occurred in 15 cases. Of the 464 cases 42 were fatal, 25 dying from gas gangrene, 4 from tetanus.

M. Weinberg (Glasgow Med. Jour., Apr., 1916) points out that most of the organisms related to gas gangrene belong to the intestinal flora.

According to W. d'Este Emery (Lancet, May 6, 1916) *perfrigens* is a frequent contaminating organism in wounds, but in most cases it fails to produce gas gangrene, and seems nonpathogenic, probably because it is readily destroyed by normal blood, and is strongly chemotactic toward leucocytes, which promptly destroy it. The special conditions leading to its rapid development are those resulting in tissue destruction and interference with local circulation.

J. P. Simonds (Jour. Exper. Med., June, 1917) found spores of the *B. welchii* group of bacteria in all uniforms of Belgian soldiers and in all samples of new cloth from which the uniforms were made; also in 15 out of 20 fresh war wounds. But 3 of the wounded developed gas gangrene. Deep lying lacerated muscle tissue seemed the most frequent seat of gas gangrene.

Pathology.—From a clinical and histological study of 11 cases C. Wallace (Brit. Med. Jour., Sept. 16, 1916) states that the lesion in its early stages is a longitudinal one, running up and down the injured muscles. Direct extension to an intact muscle is rare, except when pressure bebecomes sufficient to interfere with its blood-supply. Muscles in rigid compartments are especially prone to die, if wounded. The *muscles become resonant* from gas long before they become crepitant to the finger. Yet *crepitation* may be perceptible early with the stethoscope.

Treatment.—Fraser and Bates (Brit. Med. Jour., Aug. 5, 1916) treated 7 cases of gas gangrene by intravenous injections of **hypochlorous acid.** Four recovered. Of the remaining 3, but 1 could be regarded as an inexplicable failure. The solution employed was **lusol**, containing 0.5 per cent. of hypochlorous acid, to which was added 8.5 grains (0.55 Gm.) of sodium chloride to the liter (quart). The injection is made with a syringe, to the amount of 40 to 70 c.c. (1⅓ to 2⅓ ounces).

The hope of benefit from oxygen has had to be abandoned, according to Tansini (Policlinico, May 6, 1917), but good results have been obtained in many gas cases by **prompt excision** into sound and bleeding tissue. One should refrain from severing an entire muscle or group of muscles, but they can be slit over long distances with little harm.

According to C. Wallace (Brit. Med. Jour., Sept. 16, 1916), the circulation should be preserved when possible, and helped in every way. Tension from effusion or gas should be relieved by **free incision. Incision, or ablation, of the wounded muscle** is often sufficient to arrest the disease.

G. Campora (Gaz. degli osped. e della clin., May 28, 1916) advises **destruction** of the **primary focus,** free incision, **disinfection with hydrogen peroxide, potassium permanganate** or **iodoform and ether,** followed by pursuit of the infection along its paths of diffusion, and **free incisions,** combined **with irrigations of peroxide,** and **drainage** with gauze moistened with it.

Weinberg and Seguin (Presse méd., Feb. 22, 1917), who discovered the *Bacillus edematiens* in 1915 in certain toxic forms of gas gangrene, and in one-third of the cases of gas gangrene terminating fatally, found it in wounded subjects from all points on the military front. Next to the tetanus bacillus, it is the most violently toxic organism in wounds. They have prepared an **antiedematiens horse serum** with antitoxic and prophylactic properties approaching those of diphtheria antitoxin. While its prophylactic is much more pronounced than its curative power, it was used with success among wounded men in a few cases.

Albrecht (Berl. klin. Woch., July 27, 1916) states that some cases resist even the most radical treatment, showing yellow pallid tint, anguished facies, pale cyanosis of the lips, profound agitation, and terrible pain, death following rapidly, due to direct action of the toxin on the heart. He examined the adrenals in many cases, and found them profoundly altered; especially was there diminution and disappearance of the lipoid substance. In the surgically treated cases subcutaneous injections of ½ to 1 mg. (1/130 to 1/65 grain) of **adrenalin** should be made before or immediately after operation, and repeated on successive days. He believes he has saved some lives by this procedure.

metastatic.

In 5 cases recorded by J. N. J. Hartley (Brit. Med. Jour., Apr. 14, 1917) gas gangrene developed in tissues remote from the original infection. In 4 the metastatic gas infection occurred in the buttocks, suggesting that prolonged pressure from confinement in bed had reduced the local resistance. In the fifth it occurred over the deltoid muscle, the original infection having been abdominal. Two patients died, 3 recovering.

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management, see Hernia, Strangulated, v. 458
of lung, see Lung, Gangrene of, iii. 160; also this Index.
of skin, **quinine** in, iii. 391

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pressure, iv. 796
pulmonary, see Lung, Gangrene of, iii. 160; also this Index.
senile, iv. 802
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amputation in, 801, 802
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sublimate in, iv. 802
spontaneous, iv. 794
symmetrical, iv. 796, 802
syphilitic, iv. 802
war-wound, see also Gas-, above.

War wound gangrenous infections were studied in over 500 cases of varying degrees of gravity by Lardennois and Baumel (Presse méd., p. 506, 1916). The muscular tissue is the location of choice. All saprophytes on the individual and his clothing increase in virulence when in injured muscular tissues. They digest muscle, creating toxic products; also the vessels, creating hemorrhagic suffusions and hemolytic icterus. Gas is a by-product and may be lacking. The 500 cases gave a mortality of 15 per cent.; 85 per cent. being cured by **excision** or **amputation**. Large and free removal of skin, cellular tissue, and attacked muscle is always indicated, even when the wound is small. One should not remove an entire muscle but leave some fascia to provide for reparation and insure future function. **Heliotherapy** is of great value.

Gangrenous dermatitis, see Dermatitis Gangrenosa, iii. 802; also this Index.
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Gant's colostomy, i. 77
Gas (coal or illuminating) poisoning, v. 1

Henderson (Jour. Amer. Med. Assoc., Aug. 19, 1916) points out that the coma, tissue degenerations, and death after several days, from carbon monoxide poisoning, are not due to retention of the gas, but to injury to the brain and other organs by insufficiency of oxygen while the patient was breathing the gas.

acute poisoning, v. 2
  adrenalin in, v. 8
  ammonia (aromatic spirit) in, v. 6
  artificial respiration in, v. 7, 8
  atropine in, v. 8
  blood-transfusion in, v. 8
  caffeine in, v. 7; v. 8
  camphor in, v. 7
  digitalis in, v. 7
  ether in, v. 8
  external stimulation in, v. 8
  fresh air in, v. 6, 7
  heat in, v. 8
  Howard method in, v. 6
  massage in, v. 7
  oxygen in, vi. 7; vii. 274

The view that red corpuscles once choked with carbon monoxide are dead is not tenable, according to M. Nicloux (Presse méd., Mar. 15, 1917). All they need is **oxygen under sufficient tension** to displace the carbon monoxide. Hemoglobin in contact with 1 part carbon monoxide in 220 parts oxygen, takes up equal parts of each, half the hemoglobin becoming oxygenated, the other half carbon monoxidated. Yet, in carbon monoxide poisoning the **prolonged inhalation of pure oxygen** as soon as soon as possible will insure resurrection. In animals deeply intoxicated practically all the carbon monoxide had disappeared from the blood by the end of an hour of continuous oxygen inhalation.

  prone-pressure method in, v. 8
  pulmotor in, v. 7
  Ringer solution in, v. 7
  saline solution in, v. 7, 8
  Schäfer method in, v. 8
  sodium phosphate in, v. 6
  strychnine in, v. 7
  transfusion in, v. 8

W. H. Burmeister (Jour. Amer. Med. Assoc., Jan. 15, 1916) conducted experiments on rabbits and dogs to try out artificially preserved living erythrocytes in the treatment of carbon monoxide poisoning. The blood was collected in a solution of sodium citrate in the proportion of 1 per cent. of the salt to the total shed blood. To this there was added an equal volume of sterile Ringer's solution containing 2.5 per cent. of dextrose. This kept well for many days in the ice box. Twelve of 15 dogs treated with transfusions of this blood mixture recovered after poisoning which proved fatal in all controls. The value of **citrated, living human erythrocytes** is thus strongly suggested, and it is urged that stations be established where such prepared erythrocytes could be obtained at once.

  venesection in, v. 8
chronic poisoning, v. 5
from stoves, furnaces, etc., v. 9
pneumotoxic, of warfare, or "gassing."

Symptoms.—Pneumotoxic warfare consists in the use of vapor derived from some toxic or irritating substance, chlorine, prussic acid, etc., to kill or disable the enemy. There are said to be, according to J. C. McWalter (Clin. Jour., May 10, 1916), 43 different gases capable of being used. They may be discharged from reservoirs, as drift gas, or in an explosive or asphyxiating shell, as shell gas. The drift gas is mostly chlorine, forming a heavy greenish-yellow cloud, and often causing sudden death from edema of the glottis. Bromine is said also to be present, causing the stupor which often follows, and extreme lacrymation. Sulphurous acid and the hydrogen compounds of arsenic and phosphorus are also used.

When a man is "gassed" 3 stages are observed: (1) That in which he dies within the first couple of hours. His face is greenish-yellow, due to shock, edema of the glottis, and poisoning by the gases. (2) The second stage is described by the soldier as "dryland drowning." There is edema of the lungs, a yellow, albuminous, chlorinous fluid fills the air passages, clogs the alveoli, and suddenly oozes into the trachea with such copiousness that fluid may drop from the nose and throat. There is a violent shedding of epithelial cells, followed by acute emphysema, air escaping into the interstitial tissues, even in the neck and upper part of the chest. The patient suffers the torments of asphyxiation and toxemia alike in every anguished breath. Respirations may be 60 to 80 a minute and very shallow. Vomiting is frequent and copious, with intolerable pain in the epigastrium. The fluid is often thin and yellow, sometimes streaked with blood. In the earlier stage headache is almost constant. Of those arriving at the clearing stations, the mortality was probably about 7 per cent. Probably not more than 2 per cent. of those reaching the base hospitals succumb, but a considerable percentage of asthmatic lung trouble, etc., persisted for months. (3) These are the cases seen in the home hospitals. There may be headache, bronchitis, gastric catarrh, pleuritis, and rapid respiration. Some show stupor and weakness of the legs. Exertion may bring on an asthmatoid seizure, the roof of the mouth may be dry and glazed, and the tongue coated with a dry fur. There are also suggestions of collapse of the cerebrospinal system.

Pathology.—Mott (Brit. Med. Jour., May 19, 1917) examined the brains of 2 cases of gas poisoning. The whole of the white matter was studded with small dark spots. These were due to hemorrhages, but microscopic examination showed conditions not found in carbon monoxide or other forms of gas poisoning. The red blood-corpuscles were largely broken up, and the hemoglobin converted into dark chocolate colored pigment granules, which filled the capillaries, arterioles and venules of the white matter. This was possibly methemoglobin.

Examination of the blood in 44 cases by Miller and Rainy (Lancet, May 26, 1917) showed that when symptoms persist, there is an increase in the number of lymphocytes, relative and absolute. In slight cases this may not be beyond the normal limits. If the percentage of lymphocytes approaches that of the polymorphonuclears, the case is still suffering from the effects of the gassing, provided there is no other complicating disease.

Toushinsky (Russky Vratch, xv, No. 20, 1916) observed a case of gastric ulcer due to asphyxiating gases 3½ months after the poisoning.

Prophylaxis.—A mask or respirator saturated with a solution capable of absorbing the gas is generally employed. McWalter (*ibid.*) suggests that the following might, on emergency, be effective. A couple of folds of lint, saturated with a solution containing 10 per cent. of **sodium bicarbonate,** and 20 per cent. of **sodium hyposulphite** in water, and placed over the mouth and nose, seem to absorb chlorine, arseniuretted hydrogen, or other poisonous gas thoroughly.

In the Italian army, according to P. Sisto (Riforma medica, Nov. 20, 1916), the **masks** have layers of gauze impregnated with **aqueous or glycerinated solution of potassium carbonate, sodium carbonate,** or **sodium hyposulphite** which fix chlorine, bromine, and acid gases in general.

Treatment.—There is an overwhelming sensation of fatigue, which induces the man to lie down. He must, according to McWalter (*ibid.*), be kept moving. The best treatment is **strychnine** and **atropine** hypodermically, together with **alcohol** hypodermically or per rectum, if it cannot be taken orally.

Sisto (Riforma med., Nov. 20, 1916) states that in the Italian army the treatment consists of inhalations of **oxygen** and subcutaneous injections of **camphorated oil** and **ether, hypodermoclysis,** and venesection. **Bloodletting** is best done with the lancet, on account of the ready coagulability of the blood. **Digitalis** was of great service in the graver cases.

Hebblethwaite (Brit. Med. Jour., July 22, 1916) treated 30 cases of chlorine gas poisoning by **venesection.** It is indicated in all except the cyanotic cases, or where cardiac failure is paramount. The amount withdrawn ranges from 15 to 25 ounces, according to the patient. The results are relief of cyanosis, pulmonary congestion, and acute headache, while promoting sleep.

Unless emesis occurs, **emetics** are indicated, according to McWalter (*ibid.*). **Ammonium carbonate,** 10 grains (0.6 Gm.), well diluted, every 3 hours, stimulates and rouses the patient, and eases the breathing. **Atropine** may do good in doses of 1/50 grain (0.0013 Gm.) every 3 hours. **Stramonium** tends to prevent chronic asthma. It does best smoked or **inhaled** with **potassium nitrate.** Small doses of **ether** internally, or the **etherized tincture of lobelia** (B. P.) relieve the spasms when frequently inhaled. At a later stage small doses of **potassium iodide** are helpful. Inhalations from a steam-kettle with a long snout are very soothing as after-treatment, **Friar's balsam, oil of pinus pumilio, terebene, oil of eucalyptus,** or **oil of wintergreen** being used. The patients are not fit for the ranks for months, and even then are of little use, being prone to collapse at the slightest hardship.

Boudreau (Jour. de méd. de Bordeaux, Sept., 1916) recommends **tincture of iodine** internally as a potent means to hasten restoration of living tissues. A drop or 2 of the French tincture is added to each glass of water, milk, tea or other beverage taken during the day, 5 to 7 doses being thus taken. The dose is increased by 1 drop each day until some of his patients reached hundreds of drops a day and kept this up a long time.

[It is a matter of surprise to me that **adrenalin** should not have been used in these cases, inasmuch as it supplies the blood, as I have long urged, with the substance which takes up the oxygen of the air and becomes the active respiratory agent of the hemoglobin molecule. **Hypodermoclysis** in small quantities with adrenalin injected slowly into the rubber pipe carrying the saline commends itself as a useful procedure. C. E. DE M. S.]

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Gasserian ganglion, removal of, viii. 265
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  - hyperesthesia, see Stomach, Hyperesthesia of, viii. 336; also this Index.
  - irritability, arsenical waters in; vi. 712
    - pepsin in, vii. 362
  - neurasthenia, viii. 338
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    - pancreatin in, vii. 299
  - neuroses, see Stomach, Neuroses of, viii. 330; also this Index.
  - omentoplication, i. 42
  - pain, see Gastralgia, this Index.
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Diagnosis, viii. 377.—To differentiate gastric ulcer from cancer Zoepritz (Mitteil. a. d. Grenzgeb. d. Med. u. Chir., xxix, Nu. 1, 1916) used in 462 cases Gluzinski's method for determining whether the stomach shows oversecretion of gastric juice. Relative secretory insufficiency was found in 20.6 per cent. of 92 cases of gastric ulcer or its consequences. Hence, relative secretory insufficiency by no means excludes simple ulcer.

E. Rosenthal (Berl. klin. Woch., Nu. 34, 1916) was able by X-ray examinations to observe the perforation of a gastric ulcer from the beginning until recovery. There was at first a narrow and deep notch in the middle of the great curvature corresponding to a spastic depression; opposite this on the small curvature was a niche nearly the size of a silver quarter. The point of maximum sensitiveness to pressure corresponded to the niche.

Etiology and Pathology, viii, 373.—Gastric ulcer was produced by Steinharter (Boston Med. and Surg. Jour., Mar. 29, 1917) in rabbits by injection of staphylococcus pyogenes obtained from the blood of a patient with septicemia and from 1 with an acutely inflamed appendix. The ulcers formed were in most cases single. They occurred invariably in the pyloric end of the stomach or duodenum.

Durante (Surg., Gynec. and Obstet., Apr., 1916) found at the Mayo clinic that ulcer may be produced by any agent capable of damaging the sympathetic nervous system. On this system, which controls the circulation and sensibility of the stomach, the very life of the gastric cell may be said to depend.

Prognosis, viii. 381.—A study of gastric ulcer from the viewpoint of life insurance by H. W. Cook (Med. Rec., Jan. 22, 1916) led to the conclusion that cases free from symptoms for more than 2 years, may be accepted as insurance risks with a rating of from 175 to 250 per cent.; from the fifth to the tenth year after active symptoms, at about 150 per cent., and after 10 years, accepted as standard.

Treatment, viii. 382.—Woolsey (Med. Rec., Apr. 1, 1916) states that if thorough medical treatment for gastric ulcer is followed by 2 or more relapses, surgery should be resorted to. **Gastro-enterostomy** is the operation of choice.

J. B. Deaver (Annals of Surg., Sept., 1916) deems all ulcers of the duodenum or stomach best treated by **excision.** With a strong clinical probability of gastric ulcer, supported by X-ray evidence or by doubtful findings under palpation and inspection, he performs **gastrotomy** to inspect the mucosa. In the individual case, however, the advisability of excision depends upon the local condition. No ulcer should be excised when subsequent closure and anastomosis present too great operative hazards.

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adrenalin in, viii. 385
alkalies in, viii. 382

Hamburger and Halpern (Arch. of Internal Med., Aug., 1916) found that a 2.5 per cent. solution of sodium chloride causes complete arrest of the action of pepsin. The chlorides of potassium, barium, ammonium, etc., act like sodium chloride. They suggest that **sodium chloride** or **phosphate** be used where control of peptic digestion is desired, *e.g.*, in chronic ulcer; also for the prevention of gastric and duodenal ulcer.

Sippy's treatment (Jour. Amer. Med. Assoc., May 15, 1915) consists essentially in accurately protecting the ulcer from the gastric juice until healing can take place. From 12 years' experience he asserts that the vast majority of gastric, and more particularly duodenal, ulcers now treated surgically can be readily and more quickly cured by this method. The digestive action of the gastric juice is rendered inert from 7 A.M. to 10.30 P.M. In addition, if an excessive night secretion is detected, this is removed until the irritability of the gastric glands has subsided, by aspiration 2 or 3 times each night, if necessary. Usually after 3 or 4 days this night secretion then disappears. Subsequently the normal quantity (about 10 c.c.) of gastric juice in the stomach at night is left undisturbed.

Neutralization of the acid is accomplished by frequent feedings and by alkalies in regulated quantities. The patient remains in bed for from 3 to 4 weeks. Three ounces of equal parts milk and cream are given every hour from 7 A.M. until 7 P.M. After 2 or 3 days soft eggs and well-cooked cereals are gradually added, until after 10 days the following is being given: 3 ounces of milk and cream every hour; 3 soft eggs, 1 at a time, and 9 ounces of a cereal, 3 ounces at 1 feeding. Cream soups, vegetable purées and other soft foods may be substituted now and then, as desired. The total bulk at 1 feeding should not exceed 6 ounces. Jellies, marmalades, custards, creams, etc., are permissible.

The preliminary starvation period is unnecessary. In addition to giving an alkaline powder midway between feedings, the powders are continued every half hour after the last feeding, until 10 P.M.

Cases of stomach ulcer with stagnation are usually controlled by feeding every hour and giving a powder of 10 grains (0.6 Gm.) each of heavy calcined **magnesia** and **sodium bicarbonate**, alternating with a powder of 10 grains (0.6 Gm.) of **bismuth subcarbonate**, and 20 or 30 grains (1.3 or 2.0 Gm.) of sodium bicarbonate, midway between feedings. Cases with stagnation of food and secretion longer than 2 months usually require larger quantities of alkalies.

Ideal conditions for healing exist when the aspirated contents show absence of free hydrochloric acid during the entire time that food and the accompanying secretion are present in the stomach. Where the alkali between feedings to control all free acidity proves insufficient in the first few days, the dose is gradually increased until the acidity is regularly found controlled. Free hydrochloric acid now and then for a few minutes each day does not seriously interfere with healing.

The writer has under his medical management 25 to 30 hospital cases and more private cases at all times. Pyloric obstruction, even of the highest grade, often rapidly disappears after 10 days' or 2 weeks' treatment.

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boric ointment in, viii. 386
cauterization in.

Scudder and Harvey (Surg., Gynec. and Obstet., Dec., 1916) regard use of the **actual cautery** in chronic ulcer of the stomach a safe procedure, at least experimentally in dogs. As against excision with the knife, there was no marked difference in the rapidity of repair. Suture of the cauterized margins was also attended by practically normal repair.

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On the basis of material operated on in the Mayo Clinic during the past 10 years, Balfour (Surg., Gynec. and Obstet., June, 1917) deems, for ulcers at the pylorus, **posterior gastro-enterostomy** the operation of choice in the poor surgical risk, for although pylorectomy is followed by better results, the operative mortality is distinctly higher. The **cautery** is a useful adjunct in selected cases. For ulcers on the lesser curvature, cautery and gastro-enterostomy constitute the operation of choice. Local excision is inadequate, 32 per cent. ultimately requiring gastro-enterostomy. Sleeve or **segmental resection,** especially in large high ulcers and some hour-glass contractions, is relatively safe and yields good results. Ulcers on the posterior wall have the highest operative risk, those at the pylorus the least.

In 186 operative cases of chronic gastric ulceration studied by Témoin (Bull. de l'Acad. de Méd., Jan. 16, 1917), the return of symptoms after gastro-enterostomy or meager resection was so frequent that he now practises extensive **resection.** The outcome was most satisfactory in 117 cases. He rubs the vessels loose from the stomach wall with a compress before resecting it, leaving them intact.

Callous ulcer of the stomach, according to E. Liek (Arch. f. klin. Chir., cvii, 575, 1916), is to be **re-**sected if its site is distant from the pylorus, and also if there is the

slightest suspicion of carcinoma. In stenosing ulcer of the pylorus, if there is a second ulcer on the gastric body, posterior gastro-enterostomy should be employed.

J. K. McGregor (Can. Med. Assoc. Jour., vi, 1003, 1916) approves of the use of the cystoscope to detect an ulcer in the stomach at operation. Where the ulcer is not found, and suspicion points to the duodenum, he invaginates the latter through the pylorus for inspection through a small opening in the stomach.

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pain.

Ginsburg, Tumpowsky and Hamburger (Jour. Amer. Med. Assoc., Sept. 30, 1916) urge that hyperacidity is not a direct cause of the pain, but may indirectly induce it through stimulation of the stomach to contraction. Alkalies reduce this by neutralizing the acid. Pituitary extract causes increased contractions and pain, amyl nitrite the opposite.

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Operations in perforating gastric ulcer are divided by B. B. Davis (Trans. Surg. Assoc., St. Paul, Dec., 1916) into 2 classes: (1) Those done early before much peritonitis is present. The ulcer can be excised or turned in with sutures, so as to partially obstruct the gastric outlet, and a **posterior gastro-enterostomy** performed. Drainage should generally be used, a large rubber tube being inserted through a stab-wound above the pubes into the lowest part of Douglas' cul-de-sac, with or without drainage of the region of the perforation. (2) Operations done after peritonitis is fairly well advanced. Here one should merely stop the leak and establish drainage. The perforation should be so sutured as to narrow the gastric outlet as little as possible. Gastro-enterostomy, if necessary, can be done later. Irrigation of the abdominal cavity is strongly condemned. The **Fowler position,** cul-de-sac drainage, and **proctoclysis** are sufficient and safe.

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Patients with perforated gastric and duodenal ulcer operated on within 2 to 4 hours should, according to C. L. Gibson (Surg., Gynec. and Obstet., Apr., 1916), not have a mortality much in excess of 5 per cent. As a rule, only the simplest, speediest operation should be done. Resection and gastroenterostomy should be performed only under distinct indications, chiefly to overcome definite stenosis from closure of the perforation. Resection or gastro-enterostomy are really unnecessary, as there is a tendency to spontaneous cure of the ulcer as a result of the perforation.

Where leakage has been small and definitely limited A. D. Bevan (Trans. Chicago Surg. Soc.; Surg., Gynec. and Obstet., Apr., 1916) deems it best to mop out the stomach or duodenal contents at that point. In perforations after a fairly good meal, irrigation is essential, using normal salt solution in large amounts at about 108° or 110° F. In such cases a counter opening should be made above the symphysis, a large glass tube introduced, and while one is putting in purse-string sutures to close the perforation or perforations, salt solution should be allowed to flow freely through the entire peritoneal cavity. These cases should be drained. A modified Fowler position is advantageous, the patient being kept recumbent, but with the head of the bed elevated about 2 feet. Salt solution by rectum, 8 or 10 ounces (240 to 300 c.c.) every 2 or 3 hours, is much more comfortable than continuous irrigation.

When the perforated ulcer is high up near the cardia in an inaccessible location, or if one cannot find the perforation, or the general condition is bad, A. O. Wilensky (Annals of Surg., Oct., 1916) deems it best to exclude and put at rest the entire stomach and duodenum by means of a **jejunostomy** and jejunal feeding. This applies also to cases in which large perforating ulcers are found on or near the greater curvature, appropriate for a gastroenteric anastomosis, but with extensive adhesions precluding gastroenterostomy. Excision of the ulcer area in acute perforation is dangerous.

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Lesieur (Presse méd., Jan. 11, 1917) observed a form of subacute gastroenteritis of the hypertoxic choleriform type in 33 of 413 soldiers with gastro-enteritis, among 1230 cases of diarrhea. The mortality was 33 per cent. and the *post-mortem* findings resembled closely those of grave toxic gastro-enteritis in infants.

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According to Jacobson and Murphy (Amer. Jour. of Obstet., Jan., 1917), the gastro-enterostomy opening, to secure maximum drainage, must be of ample size, and as near the pylorus as possible, preferably in the antrum pylori. Such openings must not be made on the fundus nor the lesser curvature. Serious distention in the jejunum does not occur after gastro-enterostomy.

Where vomiting after gastro-enterostomy persists after gastric lavage and changes of position, Widere (Norsk Mag. f. Laegevid., Feb., 1917) at once opens the abdomen anew. A supplementary anastomosis between duodenum and jejunum is better than operating again on the stomach, as a rule. He has never known diarrhea or jejunal ulcer to follow gastro-enterostomy in his service.

Flint (Annals of Surg., Feb., 1917) warns that in gastro-enterostomy the new formed anastomosis is the site of a healing ulcerated surface for a period of 14 days, and that, for the first 5 or 7 days, the process is largely destructive. For the first 2 weeks, the diet should be as light as is compatible with maintenance of strength.

A series of 100 cases of gastro-enterostomy is compared by Finney and Friedenwald (Amer. Jour. of Med. Sci., Oct., 1915) with 100 cases of pyloroplasty. The 2 series are closely similar in age, sex and pathology. In the gastro-enterostomies the immediate results were satisfactory in 82 per cent., with 7 deaths, while in the pyloroplasties they were satisfactory in 90 per cent., with 5 deaths. In the gastro-enterostomy cases there were 77 per cent. of satisfactory recoveries; in the pyloroplasties 88 per cent. While gastro-enterostomy may be the operation of choice in certain cases not adapted to pyloroplasty, usually the latter is more satisfactory.

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In a case of glaucoma from atropine observed by T. Y. Sutphen (N. Y. Med. Jour., June 3, 1916), spontaneous sclerocorneal rupture and prolapse of the iris occurred. After treatment by repeated paracentesis vision was still 20/15 in the one eye. The delay in relieving the iris entanglement in the other eye resulted in an enormous corneal astigmatism.

Harold Gifford (Jour. Amer. Med. Assoc., July 8, 1916), recalling that some years ago he reported a case of glaucoma caused by homatropine, has had 4 more cases. He lays stress on reducing the tension in the use of homatropine by following it with physostigmine. He gives a vial of **physostigmine solution** to out-of-town patients, and has had no further trouble as a result.

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W. H. Wilmer (Arch. Ophth., xlv, 333, 1916), after 3 years' experience in sclerocorneal **trephining**, protests against the present unfavorable attitude toward the operation, which he regards as the easiest, safest, and most effective method yet suggested for permanently reducing excessive tension.

W. R. Parker (Arch. of Ophthal., Jan., 1917), from a consecutive series of 118 operations for the relief of glaucoma, concludes that it is better to select the procedure best suited to the individual case than to subject all stages of all types of the disease to the same operation. If further investigation confirms his results, **deep iridectomy** will be the operation of choice not only in the inflamed cases, but in selected simple cases, reserving the **trephine operation** for those in which it is contraindicated.

B. P. Banaji (Indian Med. Gaz., Dec., 1916) advocates a modification of **Elliott's operation**, in which the disc at the corneoscleral margin, after being cut with the trephine, is left in place with a hinge, usually at the corneal aspect. The periphery of the iris near the wound is buttonholed and the pillars properly replaced. The results as regards tension are very satisfactory.

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    saline purgation in, viii. 565
    scarifications in, viii. 565
    tracheotomy in, viii. 565
Glossopharyngeal nerves, disorders of, vi. 803

According to M. Vernet (Paris méd., Dec. 23, 1916), in paralysis of the lower cranial nerves, difficulty in swallowing solid food is mainly due to paralysis of the superior constrictor muscle of the pharynx, innervated by the glossopharyngeal. Vagus or spinal accessory paralysis cannot lead to such difficulties. Paralysis of this muscle is shown by the "curtain sign," the posterior wall of the pharynx moving from the affected to the normal side, and slightly upward, when nausea is provoked by deep insertion of the tongue depressor, or the patient is requested to make the "ah" or "a" sound.

Glottic spasm, **calcium chloride** in, ii. 719
Glottis, edema of, **adrenal spray** in, v. 49
  cocaine and adrenalin in, v. 51
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  tracheotomy in, v. 51
Gluteal hernia, v. 496
Glycerin, v. 28
Glyceryl trinitrate, spirit of, vii. 47
Glycosuria, v. 32

Sauer (Münch. med. Woch., Mar. 7, 1916), in performing Trommer's test for sugar, filters the urine, to which an excess of copper sulphate has been added. The earthy phos-

phates and undissolved cupric oxide are thus removed, and a clear blue solution remains, which can now be tested accurately with copper sulphate. By this method, detection of 0.4 to 0.2 per cent. of sugar is possible.

Konjetzny and Weiland (Mitt. a. d. Grenzgeb. d. Med. u. Chir., xxviii, 860, 1915) state that in about 50 per cent. of fracture cases there is a spontaneous or alimentary glycosuria. It usually appears immediately or within a few days, and begins to decrease after 10 days. True traumatic diabetes does not appear until much later.

Cannon and others having demonstrated that glycosuria occurs in animals from pain, fear or rage, F. S. Hammett (Jour. Amer. Med. Assoc., May 6, 1916) found that participation in a decisive football game caused it in 9 out of the 17 subjects; also in 6 of the 7 substitutes, and in 6 of the 13 spectators examined. It also occurred in 11 out of 27 first-year medical students given a short but difficult written examination.

On the basis of Crile's observation that lessening of glycosuria occurs in exophthalmic goiter after thyroidectomy, O'Day (N. Y. Med. Jour., Feb. 24, 1917) performed subtotal thyroidectomy in 2 cases of glycosuria. After brief improvement, both died in coma.

bacillus bulgaricus in, v. 38
diet in, v. 38
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orchitic extract in, i. 785
surgical treatment in, v. 38
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Glycyl-tryptophan test in cancer of the stomach, ii. 776, 777
Gmelin's test in choluria, iii. 306
Gnat fever, see Malarial Fevers, vi. 477; also this Index.
Godfrey's cordial, vii. 175
Goiter, v. 39

The thyroid gland, according to Kappenburg (Nederlandsch Tijdsch. v. Geneesk., Sept. 30, 1916), seems to be affected more than others by emotional influences. Twenty per cent. of 56 persons with goiter at the Utrecht Hospital presented mental impairment; only 4.4 per cent. among 437 other inmates. The connection between the thyroid and psychic depression is noteworthy.

At the Newberry State Hospital, Kemp (Mich. State Med. Soc. Jour., June, 1917) found that 28 per cent. of 425 women patients had goiter.

Chronic goiters, according to C. N. Dowd (Trans. Amer. Med. Assoc.; N. Y. Med. Jour., June 16, 1917), may affect health by nervous disturbances and interference with basic metabolism; by pressure on the trachea and adjacent structures; by causing annoyance or apprehension or discomfort from the mechanical presence of the tumor, and by causing a site for acute inflammation and abscess. Surgical intervention is strongly recommended.

Ochsner (Trans. Amer. Med. Assoc.; N. Y. Med. Jour., June 16, 1917) states that in his experience the colloid type of goiter has usually shown some cellular hyperplasia in other parts of the gland. In the post-operative toxic conditions in these patients he found it advisable to wash out the stomach, which might be a source of toxic absorption.

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  atoxic, see Goiter, Diffuse Non-toxic, v. 56
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    Blaud's iron pills in, v. 70
    bromides in, v. 72
    calcium hypophosphite in, vii. 450
    calcium phosphate in, vii. 450
    change of water in, v. 72
    cold compresses in, v. 72
    creosote carbonate in, v. 72
    diet (meat-free) in, v. 72
    ether anesthesia in, iv. 650
    Fowler's solution in, v. 69, 70, 72
    iodine and iodides in, v. 69, 70, 71; vi. 7, 30
    iodine ointment in, v. 71
    iodine petrogen in, v. 71
    ligation of arteries in, v. 72; viii. 561
    Lugol's solution in, v. 70, 71
    mercury biniodide in, v. 71
    potassium osmate in, vii. 585
    quinine and urea hydrochloride in.

L. F. Watson (Texas Med. Jour., Oct., 1916) uses injections of **quinine and urea hydrochloride** merely to relieve the symptoms of hyperthyroidism, and not to remove the goiter. They should always be made within the thyroid, to avoid forming adhesions. Small infiltrations, often repeated, are best. Weak solutions have little effect; concentrated cause necrosis and connective tissue formation. In toxic goiter preliminary anesthesia is necessary. If acute hyperthyroidism is to be prevented, preliminary injections into the most prominent portion of the goiter of a few minims of sterile **salt solution**, at 1- to 3- day intervals, followed by injections of sterile water, are indispensable. The result of quinine and urea injections depends on the amount of tissue destroyed. Cases responding best are those of beginning hyperthyroidism not severe enough for operation.

    removal, unilateral, in, viii. 561
    saline aperients in, v. 72
    sodium phosphate in, v. 72
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    surgical measures, see Thyroid, Surgery of, v. 72; viii. 560
    thymol in, v. 72
    thymus gland in, i. 792
    thyroid gland in, i. 737; v. 70

Haslebacher (Correspondenzbl. f. schweizer Aerzte, Feb. 24, 1917) has been quite successful with **vibration massage** in goiter, and last year applied the **quartz lamp** in 20 cases. The symptoms of stenosis subsided first, and the goiter grew softer after 2 or 3 exposures. Large cysts proved rebellious.

    X-ray in, v. 72
  colloid, v. 61
  congenital, v. 54

MacCarrison (Indian Jour. Med. Research, July, 1916), in a series of experiments to determine the etiology of congenital goiter, confirmed his former conclusion that it is due to the effects of toxic substances derived from the maternal intestine upon the fetal thyroid.

    artificial respiration in, v. 55
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    exothyropexy in, v. 55, 56
    hot baths in, v. 56
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    iodine ointment in, v. 56
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  exophthalmic, see Graves's Disease, v. 106; also this Index.
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  conjunctivitis, see Ophthalmia, Gonorrheal, iii. 559; also this Index.
  iritis, see Iritis, Gonorrheal, this Index.
  peritonitis, vii. 372
  tenosynovitis, see Rheumatism, Gonococcal, viii. 27
  rheumatism, see Rheumatism, Gonococcal, viii. 26
  urethritis, see Gonorrhea, viii. 684; also this Index.
  uveitis, bacterial vaccines in, ii. 420
Gonorrhea, viii. 684

Diagnosis, viii. 685.—The complement fixation test for gonorrhea was used by Shupe in 1000 instances. The result was in no case positive when the patient had not been infected with the gonococcus, or did not have gonococcic vaccine. In acute cases the test was generally negative in the first 5 weeks. If the infection remains limited to the anterior urethra, and subsides by the seventh or eighth week, the patient may never have a positive reaction. A positive reaction in a person clinically cured indicates a gonococcus focus, and these persons may infect others.

Treatment, viii. 687.—Considerable importance is attached by Dasso (Semana Medica, Sept. 28, 1916) to continuous contact of medicinal substances. He uses a rubber covered clamp to keep the urethra closed, which can be applied and removed as required, to maintain the local medication day and night.

Cano, Townsend, and Valentine (Med. Rec., Apr. 28, 1917) prepared a serum impregnated with phenol and methyl blue, which they used in over 3000 patients. Intravenous injections of this **methylphenol serum** prevented complications. Pain and other symptoms usually disappeared early, and clinical and bacteriological cures were effected in 6 weeks, or less. Ten injections generally sufficed. Intravenous and intraprostatic injections proved to be rapid and efficient, 10 c.c. (2½ drams), or more, injected into the prostate in no way jeopardizing the patient's life. Methylene blue prevents the phenol from harming the red corpuscles, and ensures rapid elimination. As soon as extension to the prostate is recognized an injection of normal phenol serum—phenol with methyl blue dissolved in anaphylactic serum—directly into the prostate must be added to the intravenous treatment.

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aconite in, i. 285
albargin in, i. 486
aluminum borotartrate in, i. 589
alumnol in, i. 591
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camphor in, ii. 731
cannabis Indica in, iii. 6
castor oil in, iii. 16
cataphoresis in, iv. 420
cinnamon oil injections in, iii. 396
colchicum in, iii. 528
creosote in, iii. 688
erigeron in, iv. 572
ferripyrin in, vi. 89
gonococcus vaccine in, ii. 346, 347, 350, 362

Müller and Weiss (Wiener klin. Woch., Mar. 2, 1916) contend that the efficiency of vaccine therapy of gonorrhea is due mainly to the febrile reaction. Similar benefit can be obtained from any non-specific alien albumin, as shown in 40 cases in which **milk** or **sodium nucleinate** was injected intramuscularly. The effect usually surpassed that of intravenous

vaccine therapy. Gonorrheal epididymitis, arthritis, prostatitis, or urethritis promptly retrogressed.

Vaccine therapy for gonorrheal affections alone will not, according to Ravogli (Ohio State Jour. of Med., Dec., 1916), extinguish the process in the urethra, but may shorten it if combined with local measures. It seems more active in secondary localizations.

M. Copelli (Giornal Ital. delle Mal. Ven. e della Pelle, Feb. 12, 1917) reports 84 cases of acute and subacute gonorrheal urethritis treated solely by **vaccines** with 64 cures, or 76 per cent.; 32 cases of chronic urethritis with 31 cures; 27 cases of epididymitis with 26 cures; and 5 cases of gonorrheal rheumatism, all cured. Failures are attributed to the fact that a vaccine is not stable in composition. Complete rest in bed is emphasized.

H. Culver (Jour. Amer. Med. Assoc., Feb. 3, 1917) compared 3 vaccines: gonococcus vaccine, giving 100 million killed organisms; meningococcus vaccine in the same dose, and colon bacillus vaccine, 25 million. The results were identical. Intravenous injection was followed after 20 minutes to 1 hour by a chill, with or without headache and nausea or vomiting, severe pain in the affected part, a slight fall of temperature followed by a slow rise to a maximum in from 1 to 4 hours. The temperature then fell to normal in 24 hours. No benefit was observed when the dose was insufficient to provoke the typical reaction.

hexamethylenamine in, v. 527, 586
hydrogen dioxide in, v. 568
hyoscyamus in, v. 578, 586
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with silver nitrate in, viii. 687
with sterile water in, viii. 687
protargol in, viii. 140, 687
silver nitrate in, viii. 687
prophylaxis, viii. 686

To prevent epididymitis, R. H. Herbst (Urol. and Cutan. Rev., xx, 194, 1916) makes an **incision in the** vas midway between the pole of the epididymis and the external ring. If done early, when the patient complains of pain in the inguinal canal and before there is swelling of the cord or evidences of epididymitis, the involvement of the epididymis may often be prevented.

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repressive treatment, viii. 687
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- Brou injection in, viii. 690
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- cold applications to spine in, viii. 690
- cold locally in, viii. 690
- copaiba in, iii. 641; viii. 688
- cubeb in, iii. 711; viii. 688
- diet, light, in, viii. 687
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- hydrastis in, v. 545; viii. 690
- immersion of penis in hot water in, viii. 688
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- water, free use of, in, viii. 687, 689
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- zinc sulphate in, viii. 690

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- alkaline mineral waters in, viii. 691
- astringent injections in, viii. 691
- bistoury in, viii. 692
- cataphoresis in, iv. 420
- cauterization in, viii. 692
- copaiba in, iii. 641
- diet, stimulating, in, viii. 691
- dilatation of urethra in, viii. 691, 692
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- formaldehyde in, iv. 735
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- hexamethylenamine in, viii. 692
- hygienic measures in, viii. 691
- intravesical irrigation in, viii. 692
- lead acetate solution, dilute, in, viii. 691
- massage of prostate and seminal vesicles in, viii. 692

Too little attention is paid to the prostate and seminal vesicles in gonorrhea, according to Jacobson (Münch. med. Woch., Sept. 19, 1916). He describes a method of bimanual examination which much facilitates exploration of these structures. The patient kneels on the table, with his hands on it. The trunk being bent over, the examiner can palpate through the relaxed abdomen, the bladder being empty, with the finger tips of 1 hand, about 2 inches above the symphysis, working toward the forefinger of the other hand in the rectum. Normal vesicles can thus be easily emptied and massage usefully applied when palpation reveals plastic infiltration or induration, or succulence testifying that the vesicles are distended with tissue fluids or pus. In several rebellious cases it revealed the vesicles hard and thick.

- potassium permanganate in, viii. 691, 692
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- rectal douching with hot normal saline solution in, viii. 692
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conjunctivitis, see Ophthalmia, Gonorrheal, iii. 559; also this Index.
Gonorrheal endometritis, see Endometritis, Gonorrheal, this Index.
iritis, **gonococcus vaccine** in, ii. 360, 420
ophthalmia, see Ophthalmia, Gonorrheal, iii. 559; also this Index.
pyelitis.

Pereira (Brazil-Medico, Oct. 28, 1916) calls attention to the frequency of pyelitis in gonorrhea at Rio Janeiro. It seems a normal feature of gonorrhea in the male. It can occur only by infection carried to the kidney pelvis by the blood or lymph.

pyosalpinx, **gonococcus vaccine** in, ii. 357
rectal.

Stümpke (Münch. med. Woch., Dec. 5, 1916) observed 88 little girls with gonorrhea in his service, including 7 infants. The only manifestations of such a process in the rectum are swelling of the extremely red mucosa at the point affected. No tendency to ulceration was ever noted.

rheumatism, see Rheumatism, Gonorrheal, viii. 26; also this Index.
urethritis, see Gonorrhea, viii. 684; also this Index.
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Gout, acute, v. 75

Diagnosis, v. 81.—An attack of acute febrile inflammation of the joints after the age of 35, in a person without a previous attack of rheumatic fever, is not rheumatism, according to J. H. Pratt (Boston Med. and Surg. Jour., Dec. 28, 1916), but gout. Acute endocarditis is not to be feared. In a case treated by 8 physicians during 27 years for rheumatic fever, a swelling of the elbow presented the typical picture of a chronic gouty olecranon bursitis; prompt relief from pain was obtained from **colchicum**. **Salicylates** rarely have any marked effect on pain in acute gout.

Terson (Paris méd., Nov. 4, 1916) found that the retro-ocular capsule of

Tenon is liable to share in rheumatism and gout. It reacts like a synovial membrane; there is an inflammatory effusion back of the eyeball, movement of which is painful.

Treatment, v. 93.—Cases treated by A. F. Chase (N. Y. Med. Jour., Nov., 1916) showed an accumulation of uric acid in the blood, about 3 mg. in 100 c.c.. The uric acid is reduced by dietary restrictions and **salicylates** and **atophan**, but its elimination is not increased by quinine, colchicum, or diuretin. Alcohol, tea, and coffee cause its retention in the blood. The purin-free diet is one excluding meat, meat extracts, peas, beans, spinach, tea, coffee, and alcohol.

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  removal of tophi in, vi. 120, 121
  superheated air baths in, vi. 120
chronic, v. 78

Diagnosis, v. 81.—Weinberger (Arch. of Diag., July, 1916) relies in the diagnosis, mainly upon the presence of tophi, and on the characteristic uric acid curve during an attack. High uricemia, low endogenous uric acid output, and delayed elimination of exogenous uric acid, etc., are either ambiguous or not distinct enough to be decisive.

From a study of the relation of gout to nephritis, M. S. Fine (Jour. Amer. Med. Assoc., June 24, 1916) concludes that since uric acid is the first of the nitrogenous substances to be retained in interstitial nephritis, while gout and early interstitial nephritis show essentially the same blood-picture, one must employ every possible test to exclude nephritis before a high blood uric acid may be regarded as evidence of gout.

Treatment, v. 93.—The excretion of calcium in the urine in gout is lower, according to Bain (Lancet, Mar. 31, 1917), than normal, most of it leaving the body with the feces. Calcium chloride in 2 cases of gout, kept on a fixed diet, caused a marked fall in the uric acid output in the urine. This suggests that foods rich in calcium should be restricted in gout, viz., spinach, celery, rhubarb, endive, pork, cheese, and oatmeal, particularly the first 4.

aërated waters in, v. 104, 106
alkaline waters in, v. 98, 101; vi. 710
ammonia bath in, v. 105
aperient waters in, vi. 711
aperients in, v. 97
baths in, v. 102, 104, 105, 106
brine baths in, v. 102
buttermilk in, v. 96
cataphoresis in, v. 101, 102, 103, 104
chalybeate waters in, v. 98
change of air and scene in, v. 99
cider in, v. 96
collodion in, iii. 536
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Donovan's solution in, vi. 675
dry, hot climate in, v. 106
dry hot pack in, viii. 813
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guaiacum in, v. 102, 104, 105, 143
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lime waters in, vi. 712
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lithium benzoate in, ii. 456
lithium carbonate in, v. 98, 103
lithium chloride in, v. 103
lithium iodide in, v. 101, 103
massage in, v. 98, 101, 104, 106
mentha in, vi. 648
mineral springs in, v. 99, 101; vi. 709
Moor baths in, v. 104

Gout, chronic (*continued*).
mustard baths in, v. 105
open-air exercise in, v. 96, 97, 103, 104
potassium bicarbonate in, v. 101, 103
potassium iodide in, v. 102
pumilio pine oil in, v. 105
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quinoformine in, v. 101
radium emanations in, v. 102
Russian baths in, v. 104
salicylic acid in, v. 103, 104, 105; viii. 57
saline baths in, v. 105
Scotch douche in, v. 101, 106
skimmed milk in, v. 96
sodium carbonate bath in, v. 105
sodium phosphate in, v. 98
sodium salicylate in, v. 98, 104
strontium iodide in, viii. 408
strontium salicylate in, viii. 408
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thermocautery in, v. 98
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tonics in, v. 99
Turkish baths in, v. 104; viii. 813
uricedin in, v. 100
vapor baths in, v. 104
water, free drinking of, in, v. 95, 96, 105
choroiditis of, mercury cyanide in, vi. 682
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  aperients in, v. 97
  diet and hygiene in, v. 96
  red wine in, v. 97
internal, v. 106
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  champagne in, v. 106
  mustard foot-baths in, v. 106
  sinapisms in, v. 106
Gouty asthma, cubeb cigarettes in, v. 105
bronchitis, pix liquidum in, v. 104
  terebene in, v. 104
hyperidrosis, picrotoxin in, v. 105
kidney, see Nephritis, Chronic Non-exudative, ii. 620; also this Index.
pain, potassium iodide in, vi. 29
retinitis, vii. 200
tophi, cataphoresis in, v. 103, 104
Gower's hemoglobinometer, v. 370
Grafting, skin, viii. 161
Grain and vegetable poisoning, viii. 575

Grand mal, see Epilepsy, iv. 528; also this Index.
Granular conjunctivitis, see Conjunctivitis, Granular, iii. 565; also this Index.
  degeneration of red blood-cells, v. 382
  endometrium, nitric acid in, vii. 46
  kidney, see Nephritis, Chronic Non-exudative, ii. 620; also this Index.
  lids, see Blepharitis, ii. 476
Granulation masses of the ear, see Ear, Granulation Masses of, iv. 715; also this Index.
  method in plastic surgery, see Surgical Anaplasty, viii. 433
Granuloma, see Mycosis Fungoides, vi. 775
Graphic methods in examination of the heart, v. 305
Gravel, see Nephrolithiasis, vi. 192
Graves's disease, v. 106

Diagnosis, v. 118.—A *bruit over the eyeball* in exophthalmic goiter is recalled by D. Riesman (Jour. Amer. Med. Assoc., Apr. 29, 1916) as a diagnostic sign he recorded many years ago. It is of a rhythmic murmur, synchronous with the pulse. The patient closes his eyes and the bell of the stethoscope is placed over the globe. A continuous hum due to the muscles of the eyelid can soon be distinguished from the bruit.

D. Smith (Can. Lancet, June, 1916) observed in all except 1 of 18 cases a to-and-fro *blowing bruit* synchronous with the heart-beat, best heard first *over* the region of the *superior thyroid artery,* and later over one lobe or the whole gland.

Etiology, v. 119.—Since the beginning of the war Léon Bérard (Bull. de l'Acad. de méd., Nov. 28, 1916) has met a relatively large number of cases in men from 20 to 45 years of age. Some had had small goiters, but the exophthalmic symptoms followed physical or mental overwork, intoxication from poor food or water, or microbic infections—dysentery, typhoid, or paratyphoid—in the form of light attacks of thyroiditis. In 3 cases exophthalmic goiter appeared suddenly, following violent emotions, repeated anxiety, or strenuous exertions. In a few days these subjects found their necks growing larger, eyes protruding, pulse rate increasing, and mental state exhibiting restlessness and anxiety. All 3 had diarrhea and lost considerable weight.

Léniez (Progrès méd., Nov. 20, 1916) observed 3 cases of typical exophthalmic goiter in military men thrown from a horse or falling from a wagon. Each had fallen on his head, and after 1, 2 and 3 months the symptoms developed. In several other instances, trauma to the head caused symptoms suggesting hyperthyroidism, particularly a slight exophthalmos.

In 52 patients treated by S. R. Pietrowicz (Jour. Amer. Med. Assoc., Jan. 8, 1916) some infection was present in the mouth, tongue, teeth, nose, tonsils, pharynx and larynx. In 35, when the infection prevailed on the right side, the right lobe was more enlarged than the left, and in 10 with infection left-sided, enlargement of the left lobe was noted.

Pathology, v. 125.—DuBois (Arch. of Internal Med., Part ii, June, 1916) studied metabolism in exophthalmic goiter in a respiration calorimeter, 37 observations being made on 11 patients, with 6 experiments on a cretin. The heat production gives the best index of the severity of the disease. A few cases showed an increase of 75 per cent. or more, and moderately severe and mild cases less than 50 per cent. A few mild and atypical cases may be within normal limits. In severe cases the warmth of skin and sweating can be accounted for entirely by the necessity for increased heat elimination.

adrenal preparations in, v. 141
alternating heat and cold in, v. 132, 141
antipyrin in, ii. 44
antithyroidin in, v. 134
arsenic in, v. 135, 136, 141
aspirin in, v. 137
atoxyl in, ii. 261; v. 135
atropine in, v. 137
belladonna in, v. 137
benzonaphthol in, v. 136
beta-eucaine anesthesia in, iv. 702

Graves's disease (*continued*).
  betanaphthol in, v. 136
  blood-pressure in, ii. 494

Treatment, v. 131.—**Injection of boiling water** into the goiter, suggested by M. F. Porter (Jour. Amer. Med. Assoc., July 12, 1913), has given good results. Local discomfort is slight; a fleeting headache is sometimes complained of. None of the 20 cases reported by Porter suffered any other untoward phenomena. Due care must be taken to avoid the large superficial veins and inject inside the capsule. The skin, after being cleansed, is anesthetized by Schleich's method. A large, glass, graduated syringe, with long, rather fine needle, is boiled in the water used for the injection. When more than 1 injection is given at 1 sitting, the syringe proper, handled with long forceps, is reboiled each time, to have the water always as near boiling as possible. "With a long needle different areas may be injected through the same skin puncture by partly withdrawing the needle. In this way both right and left lobes and the isthmus may be injected through 1 skin puncture, made in the center of the neck." The quantity injected by Porter varied from 40 to 230 minims (2.6 to 15.3 c.c.), the largest quantity in 1 treatment being 660 minims (44 c.c.). The immediate effect is destruction of thyroid tissue and colloid, a temporary increase in size and density being followed by contraction and subsidence of the general symptoms. O'Day (N. Y. Med. Jour., Apr. 3, 1915) has also reported satisfactory results.

Porter's **hot water injections,** according to D. M. Berkman (St. Paul Med. Jour., Oct., 1916), often yield immediate improvement. One death followed an injection at the Mayo clinic, but the case was one of extreme intoxication, recovery seeming impossible. Where but little improvement results from **rest in bed,** patients are sometimes sent home to continue the rest treatment; they usually return after several months in a condition permitting ligation with safety.

bromides in, v. 135, 137, 141
cacodylates in, v. 135
cactus grandiflorus in, ii. 708
calcium chloride in, v. 133, 137
calomel in, v. 141
cannabis Indica in, iii. 6
cardiac tonics in, v. 140, 141
castor oil in, v. 136, 141
chloral hydrate in, v. 137
cholagogues in, v. 136
chromium sulphate in, iii. 338
cocaine anesthesia in, iii. 495
cold friction rub in, v. 141
colonic lavage in, v. 136, 140, 141
cool baths in, v. 141
diet in, v. 132, 133, 136, 137, 140
diphtheritic antitoxin in, v. 140
electricity in, v. 138, 140
excision in, v. 138
exercise in, v. 141
faradic current in, v. 140
galvanic current in, v. 140
goat-milk in, v. 135
great altitude in, v. 141
guaiacol carbonate in, v. 136
hexamethylenamine in, v. 136
high-frequency current in, v. 138
hydrotherapy in, v. 141

The therapeutic indications in all varieties incident upon war conditions, fatigue, mental shock, or infections, according to Léon Bérard (Bull. de l'Acad. de méd., Nov. 28, 1916), include prompt **isolation** of the patient where he may feel completely safe. **Hydrotherapy** with tepid water should be utilized, and 1 Gm. (15 grains) of **quinine sulphate** and 2 Gm. (30 grains) of **sodium salicylate** given on alternate days. Ingestion of **fresh thymus** and subcutaneous injection of the **serum of thyroidectomized animals** may also cause improvement. Where, after 5 or 6 months, the disturbance is only slightly reduced, **surgical treatment** should be resorted to.

hyoscine in, v. 138
hyoscyamus in, v. 137
intestinal irrigation in, v. 136, 140, 141
iodine cataphoresis in, vi. 30
iron in, v. 141

Graves's disease (*continued*).
lecithin in, v. 141
ligation in, v. 138
meat-free diet in, v. 137
menthol in, v. 136
mercury bichloride in, v. 136
milk from normal goat in, v. 135
morphine in, v. 138
nux vomica in, v. 137
oil injections in, v. 137
open-air life in, v. 140
ovarian extract in, i. 788
oxygen baths in, vii. 275
pancreatin in.

M. B. Leviton (Jour. Amer. Med. Assoc., Jan. 1, 1916) obtained complete arrest of exophthalmic symptoms with recession of goiter on rectal administration of **pancreatin** in 15- to 20- grain (1 to 1.3 Gm.) doses 2 or 3 times a day. As this occurred in a series of cases of diabetes mellitus, the author recalls the observation of O'Day that a uniform hyperglycemia occurred in exophthalmic goiter.

parathyroid gland in, v. 137, 141
pituitary gland in, i. 781; v. 140, 141

Pal (Revue de Thérap., Feb. 28, 1914) obtained marked benefit from injections of **pituitary extract.** G. Richter (Med. Herald, Aug., 1916) also obtained good results from **anterior pituitary** in 5-grain (0.3 Gm.) doses 3 or more times a day, and refers to other observers who likewise noted the value of this agent.

podophyllin in, v. 137

L. F. Watson (Jour. Amer. Med. Assoc., Jan. 10, 1914; Sept. 25, 1915) obtained good results by injecting 10 to 40 c.c. (2½ to 10 drams) of a sterilized 30 to 50 per cent. solution of **quinine and urea hydrochloride** into the growth, in 50 cases of hyperthyroidia. He recommends the method only to relieve the latter condition and not to remove the goiter, though the latter may disappear, when small. The injection must be used with discretion. (See abstract by same author under Goiter, Chronic, this Index.)

quinine hydrobromide in, v. 132, 136, 137, 140, 141

Aiken (N. Y. Med. Jour., July 8, 1916) quotes Bumsted as stating that with **quinine hydrobromide** he has been able to cure several cases previously refractory to all other treatment, including operation, and that it can be taken for months without bad effect. The writer found it most effective in capsules or cachets, each containing 5 grains (0.3 Gm.) of **quinine hydrobromide** and 1 grain (0.06 Gm.) of **ergotin**, given 3 times daily.

quinine sulphate in, v. 133
rest in, v. 132, 140, 141
rodagen in, v. 135
salicylic compounds in, v. 136
saline aperient in, v. 136, 141
saline solution in, v. 136, 141
salt-free diet in, v. 133
salvarsan in, v. 141, 142
sanatorium environment in, v. 141
scopolamine in, v. 137
serum from thyroidless goats in, v. 133
serum of Roger and Beebe in, v. 133
sodium bromide in, v. 135
sodium cacodylate in, ii. 700, 704, 705
sodium iodide in, v. 135
sodium phosphate in, v. 136, 137
sodium salicylate in, v. 133, 136, 137; viii. 57
sparteine in, viii. 98
spleen extract in, i. 795
strontium bromide in, viii. 409
strophanthus in, v. 140, 141; viii. 412
surgical measures, v. 137, 138

A. J. Ochsner (Jour. Amer. Med. Assoc., Jan. 8, 1916) states that the danger from the anesthetic in operating for exophthalmic goiter is from 3 sources: First, too much anesthetic during the manipulations of the thyroid itself. A condition often develops during operation which seems to leave a persistent effect on the patient. This can be avoided by giving ¼ grain (0.016 Gm.) of morphine and 1/100 grain (0.0006 Gm.) of atropine ½ hour before anesthesia, and by the use of the ether drop method. After thorough anesthesia, the head is elevated 45 degrees, to secure anemia of the brain, and the operation begun. No further anesthetic is given. Such anesthesia eliminates the second danger, inspiration of mucus, which is reduced by the atropine. Pneumonia is also excluded. Gentle manipulations are essential.

From an experience on 674 cases of exophthalmic goiter, Crile (Ohio State Med. Jour., Jan., 1917) rightly holds that non-surgical treatment should be tried. If this has been done without avail, then surgical procedures calculated to break the force of the disease are indicated.

[Surgery is resorted to with unwarranted frequency. Practically every case of Graves's disease is curable without even partial removal of the gland. C. E. de M. S.]

A statistical study of cases operated upon at the Mayo clinic in 1909 was published by Judd and Pemberton (Med. Press and Cir., Aug. 9, 1916). Of the 176 patients, 121 were traced. Of these 55 patients, or 45 per cent. were cured; 22 patients, or 18.1 per cent. were practically cured but still had traces of the disease; 7 were markedly improved, but exophthalmos or nervousness remained. In 5 there was but slight improvement; in 8 there was little or no benefit. The average length of time required to effect a cure was 17.9 months.

V. C. David (Annals of Surg., Oct., 1916) found in 65 patients operated on for exophthalmic goiter from 1905 through 1914, 38 per cent. were cured and 40 per cent. greatly benefited. Of 35 patients having exophthalmos before operation only 13, or 37 per cent., reported themselves as relieved from it.

The operative mortality at the Mayo clinic for the successive years, 1910 to 1915, according to Berkman (St. Paul Med. and Surg. Jour., Oct., 1916), was 4.8, 3.18, 2.6, 3, 2.89, and 2.63 per cent. respectively. The cases included were all instances of unmistakable hyperthyroidism. It is in the rather acute cases, with special lethal tendency in the latter half of the first year, when the worst effects are shown in the heart, liver, kidneys, and nervous system, that the operative mortality is highest.

thymol in, v. 136
thymus gland in, i. 792; v. 132, 140, 141
thyroid gland in, i. 710, 735; v. 132, 140

E. G. Graham Little (Brit. Jour. of Dermat., Apr.-June, 1916) observed a case of sclerodermia associated with Graves's disease, and later myxedema, benefited conspicuously by **implantation of human thyroid into the bone marrow.** At the first thyroid implantation, made by Kocher, the thyroid was removed from a case of goiter and immediately transferred to the bone marrow of the tibia. Nine months later an implantation was made into the other tibia. Later the patient was found to have pyorrhea alveolaris, and received 12 **vaccine** injections with benefit. After an attack of herpes zoster, removal of all the teeth was advised. This was followed by notable and persistent improvement in her health and appearance.

thyroidectin in, v. 135
valerian in, v. 137
X-ray in, v. 138, 139; viii. 828

Considerable experience has led Pfahler and Zulick (Penna. Med. Jour., xix, 661, 1916) to the following conclusions: It is justifiable to give all cases a trial **X-ray** treatment, with an interval of 1 month to observe its effect. Nothing is lost if operation is then decided upon, and many cases can thus be saved from operation. Treatment should be directed at both the thyroid and thymus. An increase in weight and decrease in pulse-rate are the first signs of improvement. Hypothyroidism is produced by too prolonged treatment. The goiter and exophthalmos show little if any improvement.

Of 28 cases treated with **X-rays** by C. A. Simpson (So. Med. Jour., ix, 857, 1916), 23 showed results comparingly favorably with those from surgery in similar cases.

Malcolm Seymour (Boston Med. and Surg. Jour., Oct. 26, 1916) states that if the **X-rays** prove unsuccessful,

an operation may be done with less risk, because of their action on the thymus. The dose must be accurately measured, otherwise there may be serious burns, or total destruction of the gland, causing myxedema.

- in pregnancy, vii. 610
- mental disorders in, vii. 659, 660

Green sweating, see Chromidrosis, viii. 448
Gregory's powder, see Rhubarb, viii. 29
Griesinger's syndrome, vi. 611
Grindelia, v. 142
Grippe (la), see Influenza, v. 659; also this Index.
Growing pains, aspirin in, ii. 219
    salicylates in, viii. 56
Growth, stunted, pituitary gland in, i. 782
    thymus extract in, i. 793
Gruber-Widal reaction, i. 482
Guaiac, v. 143
  test for blood (Almén-Schönbein), v. 395
Guaiacol, v. 143
  poisoning by, v. 144
Guarana, v. 149
Gudzeit's test in chronic arsenic poisoning, ii. 139
Guinea-worm disease, see Parasites, Diseases Due to; Filaria Medinensis, vii. 318
Guisez's curved beaked guide for chain saw, vi. 259
  esophageal dilating tube, vi. 258
Gumma, viii. 463
    gold in, v. 74
    potassium iodide in, vi. 23
    salvarsan in, iv. 202
  cutaneous, perhydrol in, v. 569
Gummy infiltration, viii. 462
Gums, bleeding, hamamelis in, v. 161
  retracted, iodine in, vi. 41
  spongy, see Riggs's Disease, viii. 30; also this Index.
  swollen, alum in, i. 585
  tumors of, potassium chlorate in, vii. 583
Gunning's test for acetone, i. 240
Gypsum, ii. 712
Gyrospasm, see Automatic Rhythmical Movements, iii. 638; also this Index.

Habit chorea, iii. 332
Habitual miscarriage, see Abortion, Habitual, this Index.
Hackenbruch cocaine injection, iii. 494
Hacker's operation for gastrostomy, i. 45
Hagedorn operation for harelip, viii. 437
Hair, atrophy of, v. 149
    arsenic trioxide in, v. 150
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    epilation in, v. 150
    mercury (ammoniated) in, v. 150
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  grayness of, see, Canities, v. 151; also this Index.
  hypertrophy of, v. 152
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  pigment, atrophy of, v. 151
  secretions, disorders of, see Seborrhea Sicca.
  voluntary erection of, v. 160
  whiteness of, see Canities, v. 151; also this Index.
Hairy nevi, freezing in, iii. 531
Haller's mixture, see Sulphuric Acid, viii. 431
Hallux rigidus.

Hallux rigidus, according to Painter (Boston Med. and Surg. Jour.,

May 18, 1916), is caused by hypertrophy of the dorsum of the distal end of the first metatarsal. It is usually due to the seam of the shoe which presses against this point while the foot is in action. There is generally visible a ridge on the dorsum of the shoe over the metatarso-pharyngeal joint. Conservative treatment consists of **custom-made shoes** constructed so as to give no pressure over this joint, together with a **plate** fashioned like a flat-foot support, with a **steel tongue** the width of the great toe on its plantar surface. The more abnormal cases, in which there is no dorsiflexion, may require operation. The **ridge on the dorsum** of the **metatarsal is chiseled** away or a regular **Hüter operation** performed.

valgus, vii. 233

Milo (Nederl. Tijdsch. v. Geneeskunde, Nov. 11, 1916) holds prevailing views as to the origin of hallux valgus erroneous. It is the result of loss of the transverse elasticity of the forepart of the foot, from insufficiency of the transverse muscle. This may produce metatarsal neuralgia, Morton's disease, ostitis, etc., and hallux valgus usually follows.

J. E. Fuld (Surg., Gynec. and Obstet., Nov., 1916) describes a new method which satisfies the 3 requirements of an operation for hallux valgus; viz., (1) correction of deformity, (2) prevention of recurrence, (3) preservation of longitudinal arch. His technique is as follows: 1. Under general anesthesia, forcibly move great toe in all directions, stretching contracted tissues. 2. Paint foot and toes with iodine. 3. Make slightly curved incision about 2 inches long on inner side of great toe. A flap of skin and subcutaneous tissue is dissected free. 4. Retract soft parts and dissect abductor hallucis tendon free from base of first phalanx. 5. Turn down a flap, including bursa, capsular ligament, and periosteum, thus exposing bony deformity. 6. Apply chisel at junction of condyle and globular head of metatarsal, and excise hypertrophied bony projection longitudinally backward. 7. Irrigate with hot saline solution. 8. Replace capsule over bone, and fix with catgut sutures. 9. Tendon of abductor hallucis is then transplanted to middle of inner surface of first phalanx, and sutured with fine silk or Pagenstecher thread to periosteum. 10. Close skin. 11. Apply a plaster-of-Paris bandage to foot and toe, holding toe slightly overcorrected, and allow to remain a week or 10 days. After-treatment consists in wearing properly shaped shoes.

  beta-eucaine anesthesia in, iv. 702
  excision of diseased tissues in, vii. 234
  Mayo's method in, vii. 234
  osteotomy in, vii. 234
  removal of metatarsal head in, vii. 234
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Hammer-toe, vii. 234
  amputation of toe in, vii. 234
  binding toe to metal strip in, vii. 234
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  shoes, correct, in, vii. 234
  stovaine anesthesia in, viii. 398
  transplantation of extensor tendons into metatarsal bone in, vii. 234
Hammerschlag's technique for specific gravity of the blood, v. 369
Hammock operation (Kocher's) in movable kidney, vi. 211
Hand, angiomata of, ii. 521
  club-, see Club-hand, vii. 235; also this Index.
Hands, chapped, **agar-agar in**, i. 481
  benzoin tincture in, ii. 456
  glyceritum vitelli in, v. 30
  disinfection of, viii. 320
  fissures of, **cutal** in, i. 589
  war injuries of.

Broad, adherent cicatrices on the back of the hand following war wounds, by blocking the veins, may, according to Delorme (Bull. de l'Acad. de méd., Sept. 14, 1915), cause an edematous, shining appear-

ance suggestive of neuritis. Various tendinous lesions may also be found. Though amputation of rigid or inconvenient fingers has been the rule, the author, from experience with plastic operations, believes immediate amputation unwarranted. Partially destroyed tendons were sometimes replaced by dissecting up a cylinder of fibrous tissue between the tendon ends, shortening it with loop or U sutures, fixing it to the tendon ends, and preventing adhesion before passive movements by surrounding the repaired segment with turns or figure eight loops of catgut. Among other successful procedures was the splitting of a neighboring tendon and its implantation into the distal cut tendon, the proximal portion of the latter being simultaneously sutured to the neighboring tendon to afford greater muscular power. Cautious passive motion of the joints and tendons at the first removal of the dressing is necessary; also electric stimulation of atrophied muscles 15 or 20 times daily. If the joints swell, they are subjected to pressure with bandages. Massage of cicatrices with the thumb is begun on the fifteenth or twentieth day.

Hanging-drop preparation, v. 385
Hanot's cirrhosis, see Cirrhosis of Liver, Hanot's, iii. 396; also this Index.
Hare's artificial serum, v. 678
Harelip, viii. 434
  Dieffenbach's wellenschnitt in, viii. 437
  Hagedorn operation in, viii. 437
  Malgaigne operation in, viii. 437
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    Trendelenburg position in, viii. 436

In cases in which considerable underfeeding of ala, lip, and cheek is necessary, the subsequent contraction of the raw surface and its adhesion to the underlying bone tend to reproduce the flattening of the nostril, and to render the lip immobile, board-like, and distorted during facial movements. These ill results may be avoided, as stated by J. H. Nicoll (Glasgow Med. Jour., Jan., 1917), by the insertion of tinfoil between the soft parts and the periosteum. Mucous epithelium lines the raw tissues opposed to the surfaces of the tinplate, so that these do not adhere on its withdrawal, but form part of the buccal cavity.

Hartmann's partial gastrectomy, i. 50
Hashish, iii. 1
Hay asthma or fever, see Hyperesthetic Rhinitis, v. 600; also this Index.
Hay's pharyngoscope, vi. 246
Hayem's artificial serum, v. 678
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Head and brain, diseases of, v. 162
  angiomata of, ii. 506
  -banging, see Automatic Rhythmical Movements, iii. 638; also this Index.
  douches, viii. 81
  injuries and gunshot wounds of, v. 168, see also Brain, Gunshot Wounds of, this Index.

Prognosis.—P. Sargeant and Gordon Holmes (Jour. Royal Army Med. Corps, Sept., 1916) reported the results of gunshot wounds of the head in 1239 cases in 8 hospitals. The mortality was 3.7 per cent. In 22 *post-mortem* examinations, it was found that nearly all had died of septic infection. No death occurred when the dura remained uninjured. But 8 cases of insanity or epilepsy followed. Dullness, loss of memory, irritability, and childishness tended to disappear or diminish with time. Jacksonian epilepsy was surprisingly rare.

Results obtained by Fasiani (Gior. d. r. Acad. di med. di Torino, lxxix, 278, 1916) in 51 gunshot wounds of the head showed the advantage of early intervention. Rapid transit and advanced surgical posts for treatment of head injuries are the best means of checking the mortality from such injuries.

Treatment, v. 169.—A. Don (Lancet, May 20, 1916) reports on 150 cases of head injuries operated in a casualty clearing station in the absence of X-ray aid. He upholds early operation in all head cases to prevent sepsis. Men with head wounds do not, as a rule, return to the colors. Lodged bullets should be removed at home hospitals. As shell fragments are much more apt to induce sepsis, their removal when possible, even at a clearing station, is indicated. Comparing the large cranial openings of English surgeons and the linear or angle incision and small trephine openings of the French, he favors the latter as more appropriate in casualty clearing stations where lack of equipment obtains. The average operator can always remove dirt from the wound by a clean-cut incision; and open the cranium wide enough for the extraction of pieces of bone pressing on the dura or puncturing the brain. These essentials involve but little shock, and yield immediate results. After battles only the mild cases should be transferred to the rear; the most serious should be retained until they can stand transportation.

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Girdner's induction balance in, v. 170
Girdner's telephone probe in, v. 170
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Morgan's trajector in, v. 170
pressure in, v. 169
removal of missile in, v. 169
Winter's locating apparatus in, v. 171
X-rays in, v. 170
-nodding, see Automatic Rhythmical Movements, iii. 638; also this Index.
operations, intravenous anesthesia in, iv. 688
-shaking, see Automatic Rhythmical Movements, iii. 638.
tetanus, viii. 514
Headache.

Etiology.—Headache may be due to numerous and varied agencies. Lesions of the brain, meninges, cranium, scalp, eye, ear, sinuses, nose, teeth, etc., in which pain is caused through direct or indirect involvement of sensory nerves; various diathetic diseases, especially gout, rheumatism and syphilis; tumors, abscesses, abnormal intracranial tension, traumatisms, cutaneous irritation (as by pediculi capitis), tight or heavy headwear; blood-disorders, plethora, the anemias, cardiovascular and renal disorders; toxics, especially alcohol and tobacco; emotions, intellectual effort, muscular exertion, heat, cold, low barometric pressure, etc.; various forms of indigestion, gastric or intestinal, or both, represent but the more frequent causes of this frequently encountered symptom.

Harvey Cushing (Boston Med. and Surg. Jour., Mar. 2, 1916) recalls that the brain itself is insensitive, while the *dura mater* is extremely so. The headaches of *pregnancy* come on at a time when the pituitary is enlarged, and in similar ways one may often attribute headache to *dural stretching.* The region of the foramen magnum is supplied by the vagus, and in *gastric disorders* pain is often referred to this region. Changes in *cerebrospinal fluid pressure* may give headache; likewise, the *cerebral edema* accompanying many states, such as poisoning by alcohol, ether, and other drugs. On some of these conditions there may be merely an increase in the fluid from the plexuses.

E. Jones (Jour. of Ophth., Otol. and Laryn., xxii, 76, 1916) states that in headache due to the *maxillary sinus,* there is a full tense feeling over the superior maxillary region of the affected side or pain pressing upward to the outer angle of the eye. Headache in *acute frontal sinusitis* is present from the start, first over the sinus, later in the vertex, temporal, or occipital regions. In *anterior ethmoid diseases* there is pain between the eyes; when behind the eyes and nose there may be trouble with the *posterior ethmoid cells.* The headache in *sphenoidal disease* is most excruciating within the head and through the temples or occipital regions.

W. Freudenthal (N. Y. Med. Jour., Jan. 1, 1916) holds that when headache is present on awakening, a *nasal disorder* is a possible source. If cocainization of the nose reduces the headache, its nasal origin is the more likely; also if it increases when certain diseased areas are touched with the probe. The region most active in causing headache is not the nose but the *nasopharynx;* by treating it physicians could relieve 50 per cent. of all sufferers from headache.

Ocular headaches may be the result, according to Bedell (Albany Med. Annals, May, 1916), of a *refractive muscle* error or *local inflammation.* Occipital pain and nape of the neck discomfort, extending even to the shoulders, is often of ocular origin. Although most common in the afternoon, they may occur at any time. It may be present even with perfect distant and near vision. The eye should not be excluded until a cycloplegic has been used.

The continuous *morning headaches with high blood-pressure* were studied by Renon (Paris méd., July 1, 1916). This special type occurs in persons between 45 and 60 with arteriorenal sclerosis, due either to interstitial nephritis from scarlet fever in childhood, imperfectly treated syphilis, tobacco poisoning or excessive meat eating, to all of which a sedentary life, cares, and excessive mental work may be co-operating factors. The minimal blood-pressure is quite high in these cases. The headache may be diffuse, though sparing the occiput, or localized. It wakes the patients at 5, 6, or 7 o'clock, grows worse toward 9 and 10, and gradually subsides by noon or 1 o'clock. It may be of sufficient intensity to render all physical or mental work impossible.

Treatment of the form due to arteriorenal sclerosis described by Renon includes weaning the patient from headache remedies and tobacco. Physical and mental repose should be enforced, keeping the patient on an exclusive **milk diet** for a week, 2 liters (quarts) in the 24 hours, adding to each liter (quart) 2.5 Gm. (38 grains) of **sodium citrate.** In the following 2 weeks only milk should be allowed on 2 days each week, with a **fruit** and **vegetable** diet the other days. By the end of the third week, a mixed diet can be resumed, allowing meat only once a day, at midday. Salt should be used sparingly. If the headache persists, and the minimal pressure keeps high, **thiosinamine** is given, and kept up a long time.

[Probably the most stubborn form of headache encountered is met in persons whose health seems in no way impaired. There is merely, as an incident of advancing age, the debilitating influence of, arduous occupation, social exigencies, etc., a slight reduction in the power to carry on the various functions, including that of preparing adequately for assimilation all the food products admitted to the intestinal canal. Even at best such is seldom the case among the well-to-do classes. Various observers have estimated that one-tenth to one-seventh of the food ingested fails to be acted upon by the digestive ferments. This undigested fraction is retained sufficiently long in the intestine to be broken down by bacteria, particularly the putrefactive anaërobes, aided by the colon bacillus. To the resulting toxic products true dietetic headache is usually traceable. While normal individuals are able either to excrete actively or break down these toxic products, the subjects in question can only excrete or hydrolyse a fraction or none at all of these substances. Whatever proportion of the latter is present in the blood, gives rise to the headache—usually a severe hemicrania coming on early in the morning, and sometimes persisting all day.

The treatment of these cases is satisfactory and simple. It consists: 1, in administering a saline purgative to clear the intestine of any putrefactive remnants; 2, in abstaining from foods rich in proteids, meat, eggs, etc., at the evening meal—an essential feature, since the depression of activities which sleep entails is the cause of the accumulation of toxic wastes which engender the headache; 3, in taking 1 grain (adults), morning and evening during meals, of the **desiccated thyroid gland** to enhance the catabolism of toxic wastes. C. E. de M. S.]

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Heart, amyloid degeneration of the, v. 305
and pericardium, diseases of, v. 230. See also Endocardium and Valves, Diseases of, iv. 470
Heart, diseases of, v. 230

Diagnosis.—Castex and Vivaldo (Prensa Med. Argentina, Apr. 10, 1917) report 13 cases of acute endocarditis of the recurring type, chronic valvular disease, or asystole, in which *mental disturbances* were observed. There was concomitant kidney trouble in nearly all, with mental confusion, hallucinations, and hypochondriac depression alternating with euphoria.

H. Curschmann (Med. Klinik, Mar. 5, 1916) maintains that *lymphocytosis* and *eosinophilia* are often valuable supplementary signs in cardiac neuroses underlying hyperthyroidism. Favoring thyrotoxicosis is the *adrenalin test i.e.,* lasting mydriasis following installation of 2 drops of a 1:1000 solution of adrenalin into the conjunctival sac. The dilatation, when positive, begins usually within ½ to ¾ hour, and lasts 10 to 18 hours. Associated with it is a marked diminution or absence of convergence miosis.

Weil (Paris méd., July 1, 1916) has found that *compression of the eyeballs* acts as a sedative on hearts in a state of erethism, and causes functional murmurs to disappear. Organic murmurs, however, are rendered stronger.

Peabody and Wenthworth (N. Y. Med. Jour., June 16, 1917) found that the *dyspnea* in patients with heart disease is due in part to inability to increase the volume of air breathed, owing to limited depth of breathing. Dyspnea on exertion varies closely with the decrease in vital capacity. Ascertaining the amount of exercise which produces dyspnea, indicates the severity of the disability present.

The size of the heart can only be determined, according to A. Weber (Med. Klinik, Jan. 23, 1916), by 2 trustworthy means: *orthodiagraphy* and röntgenograms taken with the tube about 2 meters from the patient. P. M. Hickey (N. Y. Med. Jour., Jan. 15, 1916) recommends orthodiagraphy, in which parallel rays are employed. A distance of 36 to 40 inches is sufficient, with the plate placed against the anterior chest wall.

Pathology.—Josué and Parturier (Presse méd., May 3, 1917) state that the rather generally accepted rule that the kidneys are normal where the blood urea is below 0.5 Gm. a liter, and impaired where this figure is exceeded, is faulty in cardiac cases. As a matter of fact, there is in lost compensation an increase of blood urea due simply to diminished renal excretion, in the absence of actual renal disease.

Heart Diseases of Children.—J. Priestley (Brit. Jour. of Child. Dis., Dec., 1916) asserts that 40 per cent. of the children attending elementary school show some cardiac abnormality, either trivial or otherwise. Among 20,000 children examined, the organic cases showing a mitral regurgitant murmur were the most frequent, 83.1 per cent. Simple dilatation was present in 0.5 per cent.

A study of 600 cases of children from 6 weeks to 15 years old showing one or another form of heart disorder, or chorea, showed M. H. Wentworth (Boston Med. and Surg. Jour., Feb. 3, 1916) that but 30 had had rheumatism that was not followed by heart disturbance; 270 cases were apparently caused by rheumatism or tonsillitis, 82 by acute infections. Children are far more liable to attacks of rheumatism than others, and recurring attacks are more frequent.

In the treatment of rheumatism entailing heart disease in infancy and childhood, A. L. Goodman (Arch. of Pediat., Dec., 1916) gives during an acute attack **sodium salicylate**; if not well borne orally, by rectum. If the heart is already involved, he gives **fluidextract of digitalis and sparteine sulphate** in rather large doses. If there is no accompanying heart complication, he gives smaller doses, and examines the heart at frequent intervals. The children are kept in bed until all pain has disappeared and the heart sounds have improved or become normal. The moment the pains reappear, or difficulty in walking is noticed by the parents, they are placed in bed and the salicylate given every hour or 2 until the pain has disappeared.

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apocynum in, ii. 62
barium in, ii. 434
caffeine in, iii. 524, 534
calcium lactate in, ii. 716

Lorand (Münch. med. Woch., Dec. 16, 1916) holds that an unbalanced diet is especially dangerous with a weak heart, and advocates a **cereal** or **vegetable diet**, organic compounds of potassium being indispensable to keep nerve and muscle substance in normal condition, the heart muscle containing large proportions of potassium.

convallaria in, iii. 614
digitalis in, iv. 149, 156
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oxygen inhalations, vii. 274
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-block, iv. 153; v. 230, 332, 343

Symptoms, v. 233.—Krumbhaar (Arch. of Internal Med., May, 1917) describes 4 types of *transient heart-block:* (1) partial auriculoventricular block of myocardial origin, occurring during an exacerbation of acute rheumatic carditis, varying with the degree of arthritis, yet responding to atropine; (2) complete auriculoventricular block, brought on by digitalis, and temporarily reducible by atropine to a 2:1 rhythm; (3) defective conductivity in the right branch of His' bundle in the aged with arteriosclerosis, chronic myocarditis and anginoid symptoms; (4) periods of prolongation of the P-R interval (to more than 0.3 second) without adequate cause in a healthy subject.

S. Neuhof (Arch. of Internal Med., May, 1916) has observed several cases of *extrasystoles* (premature beats), 1 of auricular flutter and 1 of auricular fibrillation, due to tobacco poisoning. In a man of 28 years who had been smoking uninterruptedly since the age of 15, there was sinoauricular block—standstill of the entire heart —1 beat in every 3 to 5 beats being completely missing. With **cessation** of **smoking** and **bromides**, the sinoauricular block disappeared in 3 days, but the extrasystoles persisted, then disappeared under **digitalis**, **theobromine**, and the **Karrel diet**, compensation having been fully restored.

L. Laursen (Ugeskrift for Laeger, Jan. 27, 1916) observed *acute heart-block* in a young man who complained of headache for 2 weeks, then had a sore throat and pains in the feet, but no fever. He grew suddenly dizzy and fell, and the dizziness returned the next day or so, with cardiac oppression.

Heart-block in Children.—Frank and Polak (Neder. Tijdsch. v. Geneesk., June 10, 1916) observed heart-block in a girl of 2½ years, but did not regard the prognosis as necessarily unfavorable. The symptoms were noticed while the child had fever. The auricular beat was 107 a minute, the ventricular beat 42.8. Digitalis retarded slightly the auricle rhythm, but had no action on the disturbance in conduction.

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  morphine in, v. 344
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  Hoffmann's anodyne in, v. 344
  resistance exercises in, v. 344
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simple, v. 230

Recent experimental research has demonstrated, according to Heitz (Arch. des Mal. du Coeur, Feb., 1916), that there is certainly some connection between the cardiac fibers of the sympathetic and the conduction of the impulse, but that the latter is almost entirely, but not quite, independent of these fibers. This justifies the administration of **adrenalin** owing to its marked action on the sympathetic nerve. Danielopolu and Danulescu (Presse méd., Feb. 17, 1916) found experimentally that where incomplete dissociation of the auricular and the ventricular beats exists, injection of **adrenalin** causes almost entire disappearance of the heart-block and a pronounced increase in the heart rate. It is indicated, therefore, in cerebral anemia, sometimes fatal, which occur in attacks of heart-block.

atropine in, v. 234, 344

Atropine had no appreciable influence on the total heart-block in a case of Marui's (Mitteil. a. d. Med. Fakultät d. k. Univ. Tokyo, xv. Nu. 1, 1916). In another case the ventricular beat increased by 8 beats, showing that even with total heart-block the vagus may yet exert a certain control over the ventricle. He ascribes the extrasystoles to stimulation of the accelerator nerves. Injection of **adrenalin** induced the bigeminus picture.

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To detect enlargment of the heart an examination with the *fluoroscope* may quickly clear up the diagnosis, according to G. C. Shattuck (Boston Med. and Surg. Jour., Mar. 16, 1916).

An *orthodiagram* or a *teleoroentgenogram* may also show slight abnormality in the outline or measurements of the heart.

Josué (Paris méd., July 11, 1916) describes under the term *adrenal asystole* a syndrome characterized by a large heart with low arterial pressure. In 4 cases described the adrenals were found extremely small or diseased. Drawing the finger or a stick along the skin leaves a white mark instead of the usual red mark. There is often complete arrhythmia and auricular fibrillation, with more or less dyspnea. Digitalis had little effect in these cases, but adrenal gland had a manifest beneficial action. Used early and systematically, it can ward off or retard the otherwise inevitable fatal termination.

E. P. Bundy (Jour. Amer. Med. Assoc., June 24, 1916) describes cases of cardiac *dilatation* which gave *no signs of decompensation,* and observed usually in healthy individuals. The prominent symptoms are those of cardiac irritability, fatigue or possibly exhaustion. It is often noted in the young and well developed individual, especially in athletes, soldiers and swimmers. The chief and sometimes only complaints are shortness of breath on exertion, precordial pain, fatigue and palpitation. Frequently there is only fatigue on the least exertion. Vasomotor changes, blanching of the face, cold hands, paleness around the mouth, giddiness and faintness sometimes occur. Symptoms of neurasthenia are often prominent and misleading. They invariably have low blood- and pulse- pressure. Overwork, worry, strain, overindulgence and emotion are contributing factors.

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Morat and Petzetakis (Bull. de l'Acad. de méd., Feb. 13, 1917) found that stimulation of the accelerators, or even of 1 of them, with a moderate electric current, 5 to 10 seconds, may start the heart beating anew when it has stopped in diastole under chloroform.

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E. S. Molyneux (Brit. Med. Jour., Mar. 31, 1917) successfully practised massage of the heart through the diaphragm in 2 cases in which it had stopped beating during operation. Artificial respiration was also maintained. In the case of a wounded soldier resuscitated by cardiac massage recorded by Sichell (Brit. Med. Jour., Feb. 5, 1916), the movement of lifting him from the stretcher on to the table appears to have been the deciding factor in the cardiac failure. W. M. Mollison (Lancet, Nov. 25, 1916) reports a case of heart failure in a boy of 6 years during an operation for the removal of tonsils and adenoids, treated by heart massage, with recovery.

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    avoidance of fatigue in, v. 352
    baths in, v. 352
    diet in, v. 352
    iron in, v. 352
    mental rest in, v. 352
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Heart; movable, mobile, or wandering (*continued*).
    strychnine in, v. 352
    suitable position in bed in, v. 352
    thyroid gland in, v. 352
  muscle, physiological attributes of, v. 327
  normal, cardiogram of, v. 312, 322
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    adonis vernalis in, i. 433
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    cocaine spray in nostrils in, v. 345
    cold compresses over heart in, v. 345
    cold water sipped in, v. 345
    cracked ice in, v. 345
    dorsal decubitus in, v. 345
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    horizontal decubitus in, v. 304
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    morphine in, v. 304
    nitroglycerin in, v. 304
    surgical measures in, iii. 151; v. 304
    warmth to extremities in, v. 304
  soldier's heart.

Irritable heart, first described by Prof. J. M. DaCosta, of Philadelphia, who had studied it during the Civil War, is particularly prevalent during the present great conflict. It represented, according to Meakins, Thomas Lewis and others (Brit. Med. Jour., Sept. 23, 1916), from 50 to 55 per cent. of all cardiac diseases encountered by them among soldiers.

Symptoms.—Pallor, paroxysmal dyspnea, fatigue, and even exhaustion, on moderate exertion, sometimes accompanied by pain about the heart, tachycardia, the pulse-rate reaching often 120, and occasionally attended with arrythmia, both increased by exertion, more or less insomnia, are the more prominent symptoms; slight cyanosis, especially of the lips, is occasionally observed, also vertigo and fainting. Lian (Presse méd., May 22, 1916) states that in light cases it appears only on marching, and passes off with rest, but that in others it persists even in recumbency, with a pulse-rate often of 100.

The physical signs are variable. Systolic murmurs are frequent; the heart is usually dilated to an appreciable extent. Most authors hold that the blood-pressures, both systolic and diastolic, are low, but according to Martinet (Presse méd., Nov. 4, 1915), this is only exceptionally the case, both being high as a rule.

The patients tend to brood over their trouble; depression, suggesting melancholia, and irritability are commonly observed. So marked is the psychic factor that, as observed by Galli (Corresp.-Blatt f. schweizer Aerzte, May 15, 1915), recalling the causative event, an exciting impression, etc., may send the pulse up to 140, cause sweating, violent tachycardia, etc. In a case of Déjerine's, it rose at times to 180. Binet (Presse méd., Aug. 10, 1916) found that emotional influences, shell or bomb fire, and the fatigue due to long marches, etc., could also cause a persistent bradycardia, the pulse being slowed from 70 to 50, while in others it showed acceleration 120 or more. The latter appeared mainly among the more timid men.

Etiology.—The precise etiology of irritable heart is still obscure, according to Abrahamson (Lancet, Mar. 24, 1917). Believing that the heart cannot be damaged by overstrain, even that incident upon warfare, he incriminates toxins, the ductless glands, and the vascular nervous mechanism rather than the heart itself. Kramer (Nederl. Tijdschr. f. Geneesk., June 24, 1916) blames the excessive use of tobacco, the palpitations and arrythmia having ceased on stopping its use. Cola tablets are stated to cause the insomnia, and the abnormal use of coffee, tea and concentrated foods, for the hyperthyroidism, accompanied in some instances by perceptible enlargement of the thyroid. The emotional factor, mobilization, active field work, etc., is also deemed important. Korach (Berl. klin. Woch., May 17, 1915) found that when the men were entirely relieved of physical and emotional stress, steady improvement occurred, followed by recovery, unless extra systoles and very high blood-pressure were features of the case. Schlesinger found psychic influences to account for one-half of the cases of cardiac dilatation observed by him during the present war. The latter is prolific in cardiac neuroses, and the fact that most cases are encountered in the hospitals nearest the firing line, indicates the pathogenic influence of emotion, excitement and perhaps fear. Sajous holds that true soldiers' irritable heart is mainly due to excessive activity of the adrenals, induced by fear, excitement, etc., leading to exhaustion of these organs. The heart and blood-vessels being deprived of the organic substances which sustain their tone, the specific symptoms of the disorder are awakened.

Pathology.—Various authors, Monckeberg, Rehfisch (Berl. klin. Woch., Nov. 29, 1915) and others, found that as a result of military hardships, arteriosclerosis developed in a large proportion of cases, 43 per cent. as shown by autopsies,—a possible factor of cardiac irritability. The complete recovery of most of these cases tends to refute this view. Aschenheim (Münch. med. Woch., May 18, 1915) found the testicles of 74 per cent. of cardiac neuroses smaller than normal, with scanty hair, etc., and suggests a predisposing constitutional inferiority, which affects also the ductless glands. Septic conditions of the tonsils, intestinal autointoxication, diarrhea, etc., and other concomitant or antecedent disorders have been observed. These disorders can hardly be regarded as causes of irritable heart, when we take into account the frequency with which it occurs irrespective of any such disorders.

Treatment.—On the whole, **rest** and **digitalis**, and very gradual resumption of physical exercise are indicated. The following mixture was found extremely beneficial by I. Mackenzie (Glasgow Med. Jour., Oct., 1916) in many cases of "soldiers' heart":—

℞ *Ammon. brom.*	24 Gm.	(6 dr.).
Liq. extract ergot .	24 c.c.	(6 dr.).
Tinct. digitalis	8 c.c.	(2 dr.).
Spt. ammon. aromat.	16 c.c.	(½ oz.).
Aquæ ....ad	180 c.c.	(11 oz.).

M. Sig: (1) One-half ounce in water, after meals every 4 hours for 2 days; (2) one-half ounce in water, after meals 3 times a day for a week after; (3) gradually reduce to twice daily, and then once daily according to reaction.

After the abnormal fatigue ceases, **massage** is indicated, and also **cool baths** instead of warm baths. Graded exercise should then be started under observation.

Recruits.—A. Morison (Brit. Med. Jour., Oct. 30, 1915), on the basis of considerable experience in determining the suitability of officers and men for military service on account of some cardiac condition or anomaly, comments on Sir James Mackenzie's conclusion that an *organic valvular lesion* should not be regarded as a reason for rejection, provided the muscular action of the heart be satisfactory. The British Army Medical Service, however, had found it advisable to absolutely reject a recruit with organic valvular disease. This applies also to *endocardial murmurs,* an *extrasystolic heart,* and *auricular fibrillation,* usually found associated with mitral valvular disease. A man may be accepted, however, when functional bruit at the apex disappears on assuming the erect position; when he shows a rhythmical variation of pulsation associated with respiration, associated perhaps with an occasional reduplication of the second sound, the symptoms being purely physiological.

J. K. Fowler (Brit. Med. Jour., Nov. 20, 1915) lays stress on the *effect of change of position* upon the sound. Unless a case of suspected valve disease is examined both in the standing and recumbent position, he deems it of no value. A functional and false murmur which often disappears when the patient lies down, is almost certainly not due to organic disease of a valve. Auscultation of the trachea is also important. A murmur here may be transmitted from an aortic stenosis; or be due to the impulse of an aneurism; or again to the cardiac impulse causing an air wave in the bronchi and trachea. Mitral murmurs are not audible in the trachea. False murmurs often disappear completely when the breath is held. Parkinson (Lancet, July 22, 1916) found that some simple *exertion test,* such as climbing 25 to 50 steps, reproduces the symptoms, and so furnishes valuable information on the functional efficiency of the heart, if such be present.

Soldiers in Service.—Treupel (Med. Klinik, Mar. 28, 1915) is impressed with the ease with which many cases of old, *well-compensated valvular defects* are bearing the strain of active military service without harm. This applies only, however, to those who are eager to be in the fray. If a man with a valvular defect is sent to the front against his will, or with only passive consent, the valvular defect is liable to be heard from soon.

C. Fiessinger (Bull. de l'Acad. de Med., Dec. 29, 1914) also emphasizes the satisfactory showing made in active service by 12 men suffering from chronic valvular or myocardial disease, when *prophylaxis* through the use of the intermittent small doses of digitalis, to prevent sudden dilatation under active exertion, is insured. In most instances, 0.1 mg. ($\frac{1}{650}$ grain) of crystalline **digitalin** (French) was given on 2 or 3 consecutive days in each week. Where signs of myocardial weakening under stress had already been discerned, the drug was given during periods of 10 consecutive days, separated by 4-day intervals. Primarily valvular affections withstood active service better than the myocardial cases.

The physical signs suffice, according to Meakins and Lewis (Brit. Med. Jour., Sept. 23, 1916), to recognize about 40 per cent. of the men referred to them for cardiac symptoms as unfit. Most of the others showed various symptoms, dyspnea, palpitation, vertigo, or fainting. By suitable exercises an additional 5 per cent. of the original group were found unfit for service, but in all about 50 to 55 per cent. of soldiers suffering from cardiac symptoms were found fit for some form of military duty by the tests. All of the men in this group were suffering from what has recently been called "irritable heart" (see above).

-strain, **cactus grandiflorus** in, ii. 708

William Russell (Brit. Med. Jour., June 24, 1916) urges that more attention be paid to the right side of the heart. Visible pulsation over the body of the heart is due to the right ventricle, and may be due either to its dilatation or to the heart being pushed close to the chest wall by an enlarged left ventricle. Absence of the first sound heard over the right ventricle indicates weakness of that chamber, and is common in fatty infiltration. Sudden death is a frequent termination in such cases.

syphilis of.

Anders (N. Y. Med. Jour., May 6, 1916) states that most cases of cardiac syphilis he has treated were late cases, usually with aortic regurgitation in decompensation, or of myocardial degeneration. Even where dropsy has supervened, complete **physical rest, digitalis** and other cardiants, are indicated; and **salvarsan** in myocarditis and aortic insufficiency where the lesion is indeterminable.

T. E. Satterthwaite (Therap. Gaz., Jan., 1917) urges that interrupted or inefficient treatment establishes a resistance to the specific drugs employed. A vigorous and carefully systematized use of **old salvarsan** with **mercury** and the **iodides**, combined, or singly in early cases, is essential.

tobacco, **aconite** in, i. 285
  cactus grandiflorus in, ii. 708
  convallaria in, iii. 614, 615
  sparteine in, viii. 97

tumors of the, v. 346
  Coley's fluid (if sarcoma) in, v. 347
  mercury biniodide in, v. 347
  sodium iodide in, v. 347

valvular diseases of, see Valvular Diseases of the Heart, iv. 481; also this Index.

weakness, see Heart, atony.

wounds of the, iii. 133

Symptoms.—The tolerance of the heart to injuries has recently been emphasized in many instances. In a soldier treated by Grandgérard (Paris méd., Jan. 13, 1917) a shrapnel ball entered at the shoulder. Radioscopy showed that it had entered and lingered in the right auricle and passed thence into the inferior vena cava and the femoral vein, finally lodging in the hypogastric vein, all without inducing any appreciable symptoms. Again, under the radioscopic screen Lobligeois (Bull. de l'Acad. de méd., lxxvi, 364, 1916) detected a bullet in the left ventricle. Its movements corresponded with each cardiac pulsation; at the end of the diastole the bullet rested on the lower border of the heart near the apex, then at systole it moved rapidly from left to right. The patient had recovered, and was in no way being disturbed by the foreign body. A similar case was reported by Silvan (Riforma Med., xxxii, 297, 1916). Leriche (Brit. Med. Jour., Oct. 4, 1916), referring to the fact that a man had lived 3 hours after a machine gun bullet had pierced the left ventricle of the heart, the left lung, and produced a vast hemothorax, pointed out that in wounds of the heart death was immediate only in 1 out of 6 cases.

The bullet may excite reflex and other distressing symptoms, and yet not menace life. In a case observed by Glaser and Kaestle (Münch. med. Woch., May 25, 1915) the left arm was impotent, and the patient could not breathe normally when lying on either side. He also complained of stabbing pains in the left side, radiating from the costal arch to the shoulder and arm, sharper after eating, keeping up for about an hour.

In a man in whom a bullet had penetrated the pericardium, Armstrong (Annals of Surg., June, 1914) observed *auricular fibrillation,* though no previous inflammatory mischief or symptom of cardiac involvement had previously existed. Cessation of the disordered rhythm followed removal of the bullet.

Treatment.—W. Wayne Babcock (N. Y. Med. Jour., June 10, 1916) points out that the human heart is even more tolerant of surgical manipulation than that of the cat or the dog. Local anesthesia or para vertebral nerve blocking with a 1, ½ or ¼ per cent. **novocaine** solution is to be preferred for the chest wall. At times an associated moderate narcotism with **scopolamine-morphine** is desirable, or a slight ether narcosis, to be preferred where haste is essential. A shocked, semi-unconscious patient may require no anesthetic. If the pleural cavities are to be invaded, **intratracheal insufflation** after the method of Meltzer-Auer has advantages. To restrict the action of the vagus, a preliminary injection of **atropine** may be given subcutaneously, while **cardiac massage** and the intravascular injection of **adrenalin,** avoiding any excess, are most valuable methods in starting the arrested heart. Gunshot wounds have been found more dangerous than incised wounds.

The advisability of early removal is suggested by a case of Couteaud and Bellot's (Revue de chir., Dec., 1915) in which syncope and dyspnea after exertion, severe palpitations, and a constant sensation of constriction and oppression in the chest, led to extraction of the bullet 6 months after the injury. Scraps of cloth were found in its bed in the auricle wall.

To extract missiles from the heart and pericardium, O. Laurent (Bull. de l'Acad. de méd., Nov. 30, 1915) exposes the anterior and lateral aspects of the heart, and makes a horseshoe flap of skin and muscle with its pedicle over the sternum. Portions of the second, third, fourth, or fifth cartilage are resected and the pleura covering the heart detached and reflected outward. Where the foreign body is located posteriorly, access, as in the anterior cases, is obtained by 1 or 2 costal cartilages, from the second to the fifth, followed by a lateral incision 2 or more cm. long on the lateral aspect of the pericardium, thus exposing the posterior pericardium and posterior cardiac surface.

Bichat (Bull. et mém. Soc. de chir. de Paris, xlii, 1100, 1916) extracted a piece of shell from the right ventricle. The latter was caught between 2 fingers and pulled forward, incised, and the piece of shell removed by forceps; some black blood escaped, but a few catgut sutures produced hemostasis. The pericardium was sutured. The condition appeared to progress satisfactorily for more than a week. On the 13th day after operation signs of pericarditis appeared, which proved fatal.

  artificial respiration in, iii. 138
  exploratory pericardiotomy in, iii. 137
  massage of heart in, iii. 138
  suture of heart in, iii. 134, 137-150
Heat apoplexy, see Thermic Fever, v. 356; also this Index.
 exhaustion, v. 353
  prophylaxis of, v. 356
   avoid direct exposure to sun, v. 356
   avoid fatigue and worry, v. 356
   avoid meats and alcohol, v. 356

Heat exhaustion, prophylaxis of (*continued*).
    cleansing of skin, v. 356
    clothes light and loose, v. 356
    cool baths, v. 356
    cool (not iced) drinking water, v. 356
    cool fruit juices and lemonade, v. 356
    diet digestible and light, v. 356
    electric fans, v. 356
    open shaded windows, v. 356
    rest in shade at midday, v. 356
  treatment of, v. 356
    affusions in, viii. 812
    ammonia (aromatic spirit) in, v. 356
    atropine in, ii. 450
    caffeine in, v. 356
    camphorated oil in, v. 356
    digitalis in, v. 356
    friction to extremities in, v. 356
    head horizontal or nearly so in, v. 356
    hot blankets in, v. 356
    hot stimulating drinks in, v. 356
    hot-water bottles in, v. 356
    ice-bags in, v. 356
    ice rub in, viii. 810
    spray bath in, viii. 809
    strychnine in, v. 356
    whisky in, v. 356
  stroke, see Thermic Fever, v. 356; also this Index.
Hebephrenia, iii. 764
Heberden's nodes, vi. 112
Hebra's itch ointment, ii. 713; viii. 427
Heel, neuralgia of, vi. 821
  painful, of gonorrhea, see Rheumatism, Gonococcal, viii. 27
Hegar's operation, vii. 644
  sign in pregnancy, vii. 586
Hegonon, see Silver, viii. 129
Heinecke-Mikulicz pyloroplasty, i. 43
Helferich's method in arthrectomy, vi. 137
Heliotherapy, vi. 356

The Rollier method of heliotherapy is simplified by W. C. Campbell (Amer. Jour. of Orthop. Surg., Jan., 1917) as follows: Beginning above at the neck, with the head shielded, and below at the feet, he exposes 2 to 4 inches for 5 minutes twice a day, increasing the time and surface at this rate until the entire body is exposed. The time is then increased, according to tolerance, to 3 to 10 hours. Spinal and hip cases are kept in one position until acute symptoms have subsided and the body is well pigmented, when the other half is exposed. Improvement usually corresponds with pigmentation. Negroes respond as well as whites.

Heller's test for albumin, i. 502
  for blood, v. 395
  for indican, v. 648
Hemamebiasis, see Malarial Fevers, vi. 477; also this Index.
Hemangiomata, ii. 502

In hemangioma Stromeyer (Münch. med. Woch., Oct. 17, 1916), presses out its contents, compressing the afferent vessels, and **injects alcohol** against all its walls. **Compression** is continued a minute or 2 after the injection. In 30 cases results were prompt and complete. The procedure is repeated at intervals of 1 or 2 weeks. A hemangioma of walnut size, yields to 3 or 4 sittings.

  of eyelids, see Eyelids, Hemangiomata of, iv. 724
Hematemesis.

Varieties and Etiology.—The blood from the stomach may be bright red, or occur as a reddish fluid with brownish and reddish clots, or as a brownish fluid with coffee-grounds material, or as red clots in ordinary vomitus. The chief factor in its appearance is the time it has been exposed to the gastric ferment. Slight hemorrhage may be derived, according to Cross (L. I. Med. Jour., Jan., 1917), merely from a congested stomach subjected to repeated vomiting or retching. Rupture of an aneurism into the stomach or esophagus usually, but not always, results in copious hematemesis. Bleeding from a gastric or duodenal ulcer is likely to be considerable. In malignant growths of the esophagus or stomach vomiting of coffee-grounds material occurs in 60 per cent. of cases; occasionally there is a large hemorrhage. Copious bleeding may come from engorged gastric or esophageal veins in cirrhosis of the liver. Enlargement of the spleen and mitral stenosis are also possible causes. In purpura, scurvy, hemophilia, primary anemias, and chronic nephritis, gastric hemorrhage may result from chemical alteration in the blood. Other causes are corrosive poisons, acute bacillary gastritis, acute infections, and vicarious menstruation.

Referring to hematemesis due to hepatic cirrhosis, Balfour (Trans. Amer. Med. Assoc.; N. Y. Med. Jour., June 9, 1917) cites the accumulating evidence that the spleen is responsible for certain types of hepatic cirrhosis, and that early splenectomy will probably prevent further liver changes. That gall-bladder infection and appendicitis may be directly responsible for hematemesis has been shown by results of operations. It is more than very probable, however, that these or other foci cause the gastric bleeding by first setting up toxic changes in the liver.

Moschowitz (Amer. Jour. Med. Sci., Nov., 1916) refers to cases having no complaints referable to the stomach, and in which suddenly, without warning, the patient vomits blood profusely. Profound anemia follows. Examination of the stomach reveals nothing noteworthy. The disease is most frequent in females in the early twenties. In each of the writer's cases the abdomen was opened, but no evidence of ulcer could be found. All recovered.

A case of death from hematemesis beginning the third day after chloroform narcosis is reported by J. Jedlicka (Casop. lek. cesk., No. 34, 1916). Autopsy showed that the chloroform had caused fatty degeneration of various organs, especially the gastric and duodenal mucosa, and that the gastric juice had caused a circumscribed digestion in the areas of fatty degeneration down to the vessels.

Treatment.—The patient should be promptly put to bed, and kept absolutely quiet, both generally and locally, by giving **morphine** hypodermically, and imposing, at first, complete starvation. If bleeding is not very copious, 10 to 20 drops of 1: 1000 **adrenalin chloride** solution should be given. According to Cross (L. I. Med. Jour., Jan., 1917), granting that contact of adrenalin with the ruptured vessel is effected, one may expect benefit lasting from ½ to 2 hours. Ewald has suggested **gastric lavage with ice water.** Calcium salts, according to Cross, given per orem are irritant, and frequently provoke vomiting, while by rectum they are rarely retained long enough to be absorbed. Large doses of **bismuth salts** probably act mechanically. Capsules of **gallic acid,** 10 grains (0.6 Gm.) may be well borne. **Horse serum** is very valuable in doses of 20 c.c. (5 drams). When repeated, the possibility of anaphylactic phenomena must be remembered. **Coagulose,** a sterile powder containing fibrin ferment from the horse, dissolved in water at 98° and injected subcutaneously in doses of 1 ampoule in ½ ounce (13 c.c.) of water, is useful. A second dose can be given in 1 or 2 hours, and in persistent hematemesis 3 or 4 doses daily for several days. **Human serum** or **fresh human blood** may be used subcutaneously without fear of anaphylaxis, but the danger of lues is a disadvantage.

In profuse hemorrhage, causing shock, **morphine** is indicated. **Saline hypodermoclysis** is probably of value. A slow **Murphy drip** is unquestionably useful. Direct **transfusion of blood** would be of value in desperate cases. The immediate mortality of hematemesis is 5 per cent. or less.

acetic acid in, i. 231
atropine in, ii. 451
calcium lactate in, ii. 717

In a case of hematemesis occurring 6 hours after gastro-enterostomy in a young man, arrested by ice and morphine, but starting again later, Meyer (Münch. med. Woch., Dec. 26, 1916) gave the patient the contents of a tube of **coagulen,** a blood platelet extract. The vomiting and bleeding stopped at once. This remedy acts only on direct contact; it should be given directly after vomiting, or while the stomach is open during an operation.

Hematemesis (*continued*).
  emetine hydrochloride in, vi. 60
  gelatin in, v. 15
  hydrastinine in, v. 547
  lead acetate in, vi. 313
  tannic acid in, viii. 498

Donaldson and Camac (Med. Rec., Feb. 26, 1916) have reported a case of repeated hematemesis in a girl of 19 years in which the red cells became reduced to 1,800,000, and the hemoglobin to 22 per cent. A direct vein-to-vein transfusion from her twin brother was followed in 2 hours by a profuse menstrual discharge, more or less continuous for 8 days. Five hours after the transfusion she was given 55 c.c. of horse serum intravenously. This was followed in a few hours by her seventh and last hematemesis. After 2 subsequent transfusions she improved steadily and permanently. Recovery seemed due largely to the transfusions.

  turpentine in, viii. 635
Hematocele, vii. 354
  bed-rest in, vii. 354
  elevation of scrotum in, vii. 354
  iodoform-gauze packing in, vii. 354
  lead-water and laudanum in, vii. 354
  opening of tunica vaginalis in, vii. 354
  strapping in, vii. 354
Hematology, v. 368

The following method of blood staining is recommended by B. G. R Williams (N. Y. Med. Jour., Sept. 16, 1916) as being simple, rapid, and invariable, and because it is practically impossible to overstain with it: Hematoxylin (Ehrlich), 2 parts; glacial acetic acid, 10; glycerin, absolute alcohol and distilled water, of each, 100; and potassium alum (an excess). To this filtrate is added 0.1 Gm. (1½ grains) of water-soluble eosin. Alcohol flash fixation is used. With this stain diagnosis of the anemias, leukemias, eosinophilias, etc., is easy. Differential counting is much more satisfactory than with Wright's stain, because of the good nuclear staining.

Studying the preservation of living red blood-cells *in vitro*, Rous and Turner (Jour. of Exper. Med., Feb., 1916) found that cells are often much damaged in washing in salt solution. Gelatin will protect them against a certain amount of mechanical injury. Sheep cells washed in Locke's solution with a little gelatin keep nearly 2 months if placed in a mixture of Locke's solution and an isotonic sugar solution. In a mixture of citrate and sugar, human cells remain intact for about 4 weeks. In transfusion in rabbits, cells preserved in mixtures of blood, sodium citrate, saccharose and water for 14 days replaced normal blood satisfactorily. Where kept too long, the cells are disposed of without harm.

Hematoma of the ear, iv. 712
  of septum, see Septum, Hematoma of, vii. 92
  of thigh.

A case of calcified hematoma in a boy following an injury to the thigh is reported by Kidner (Jour. Amer. Med. Assoc., Jan. 20, 1917). The fibrous tissue and periosteum probably both take part in such cases. The mass was found intimately adherent to the femur.

  of vagina and vulva, viii. 774
Hematometra.

In a woman of 74 who had menstruated normally until 35 years previously, severe pain, pointing to obstruction of the urinary flow, led G. Gellhorn (Surg., Gynec. and Obstet., Jan., 1917) to detect a large fluctuating tumor which filled the entire pelvis, extending almost to the umbilicus. The vagina was occluded by senile atresia. Laparotomy under spinal anesthesia showed the tumor to be an enormous hematometra and hematocolpos with bilateral hematosalpinx. Panhysterectomy was performed, and the tumor removed unopened.

Hematomyelia, viii. 294
Hematoporphyrinuria, v. 392
  adrenal preparations in, v. 392
  Blaud's pill in, v. 393
  saline solution in, v. 393
  transfusion in, v. 393
Hematorrhachis, viii. 294

Hematoxylon, v. 394
Hematuria, v. 394

Among 238 cases H. L. Kretschmer (Jour. Amer. Med. Assoc., Feb. 24, 1917) found a tumor the commonest cause; tuberculosis was next, followed by renal calculus and colon bacillus infections. In 14 the source of bleeding was determined, but neither cystoscopy nor ureteral catheterization showed its origin. In the remaining 25 neither source nor cause could be determined.

In 11 cases of "essential" hematuria Payne and MacNider (Jour. Amer. Med. Assoc., Sept. 23, 1916) always found an overgrowth of connective tissue, caused probably by localized inflammation, at the corticomedullary junction in the kidney. This probably causes a congestion of the venules which lie beneath the mucosa of the papillæ. Sections showed thrombosed and even ruptured veins. If **styptics** to the renal pelvis fail, **nephrotomy** should be done. Cure resulted in each of 8 cases.

- **acidulous drinks** in, v. 401
- **alum** in, v. 401
- **arbutin** in, v. 401
- **balsams** in, v. 401
- **blood-serum** in, v. 399, 401
- **calcium salts** in, v. 401
- **cannabis indica** in, iii. 9
- **castor oil** in, v. 399
- **cold** in, v. 401
- **compression** in, v. 401
- cystoscopy in, viii. 677
- **diaphoretics** in, v. 401
- **diet** in, v. 399, 401
- **epinephrin** in, v. 399, 401, 402
- **ergot** in, iv. 572; v. 399, 401
- **exploratory incision** in, v. 402
- **formaldehyde** in, iv. 735
- **gallic acid** in, v. 401
- **gelatin** in, v. 399
- **hamamelis** in, v. 401
- **hexamethylenamine** in, v. 401
- **hot applications** in, v. 401
- **hydrastis** in, v. 401
- **ice-water** in, v. 401
- **iron perchloride** in, v. 401
- **lavage of bladder** in, v. 401
- **lead acetate** in, v. 401

Hematuria (*continued*).
- **morphine** in, v. 399, 401
- **nephrectomy** in, v. 402
- **nephrotomy** in, v. 401, 402
- **opium suppositories** in, v. 401
- **overdistention** in, v. 402
- pyelography in, v. 402
- **pyelotomy** in, v. 401
- **removal of calculi or tumors** in, v. 402
- **renal decapsulation** in, v. 401
- **rest** in, v. 401
- **saline laxatives** in, v. 401
- **silver nitrate** in, v. 401
- **surgical measures** in, v. 401
- **tannic acid** in, v. 401; viii. 498
- **tuberculin** in, v. 401
- **turpentine** in, v. 401; viii. 635
- ureteral catheterization in, v. 402
- bacillary, v. 399
- endemic (from schistosomiasis), **hyoscyamus** in, v. 579
- malarial, **methylene blue** in, vi. 687
  - **sodium hyposulphite** in, viii. 190
- renal, ureteral, urethral, or vesical, v. 399

Hemeralopia.

Night-blindness has been found frequently among soldiers. Weekers (Arch. d. Ophth., Mar.-Apr., 1916) believes it is provoked by nocturnal fatigue, nervous upsets, anxiety or overexertion in the trenches. Eyestrain from errors of refraction is an important factor. The unvarying diet, preserved foods, and dazzling from bright lights are also involved. The treatment is that of the cause. Smoked glasses during the day are a valuable adjuvant.

Hemicrania, vi. 821
- **acetphenetidin** in, i. 251
- **menthol** in, vi. 649

Hemin (Teichmann) test for blood, v. 395
Hemiplegia, see Cerebral Hemorrhage, iii. 89

In a hemiplegic patient, aged 52, for 21 years confined to chair and bed, and with the right thigh flexed so that the heel pressed into his buttocks, Elliott and Boorstein (Jour. Amer. Med. Assoc., July 1, 1916) had the man stand on his good leg for 10 or 15 minutes at a time about 10 times a day, and massaged the paralyzed side. By **tenotomy** of several

flexor muscles, and using force, his leg was brought to 135°, and the foot slightly corrected. The limb was then put into **plaster** for 2 weeks. Active **hyperemia** and **massage** were used daily. In the course of a year the knee was straight. In 3 months after a second operation he was able to walk out, and later could flex his knee and bear weight on his limbs without the brace. Afterwards his upper extremity was also treated. Evidently there is no time limit for improvement in hemiplegia. Orthopedic treatment should be begun very soon after the attack, with light massage and **passive exercises**.

infantile spastic, iii. 113
Hemiplegic contractures, **baths, prolonged, warm**, in, viii. 812
Hemispasm, facial, **magnesium chloride** in, vi. 477
Hemochromatosis, splenomegaly in, viii. 307
Hemocytometer of Thoma-Zeiss, v. 375
Hemogallol, vi. 76
Hemoglobin, vi. 76
estimation of percentage, v 370, 410
Hemoglobinometer, Fleischl, v. 370
Fleischl-Miescher, v. 372
Gower, v. 370
Sahli, v. 370, 371
Tallqvist, v. 369, 370
Hemoglobinuria, v. 402

Studies by C. S. Williamson (Arch. of Internal Med., Oct., 1916) in 919 subjects showed that the hemoglobin varies greatly at different ages, following a definite curve. From birth to the 16th year, variations are so marked as to necessitate consideration of the age in comparing the hemoglobin with the normal in any given case. The hemoglobin falls within the first year from 23 grams per 100 c.c. to 13 grams, then rises. Between 16 and 60 there is a distinct difference between the 2 sexes, the average being 17 grams in males and 15.5 grams in females.

blood-picture in, v. 407, 408
epidemic, vii. 41
hemolysis in, v. 406, 407, 408, 409
malarial, v. 403, 404, 411; vi. 532

Hemoglobinuria, malarial (*continued*).
alcohol forbidden in, v. 411
atropine in, vi. 536
blood-picture in, vi. 533
caffeine in, vi. 536
calcium salts in, ii. 717, 718, 719; v. 411
calomel in, vi. 536

According to K. Ross (Jour. Florida Med. Assoc., June, 1916), nephritis always exists in malarial hemoglobinuria. Repeated large doses of **calomel** are advised; also ⅛ to ¼ grain (0.008 to 0.016 Gm.) of **pilocarpine hydrochloride**, given every 4 hours as long as the hemoglobinuria persists. For nervousness, 20 to 30 grains (1.3 to 2 Gm.) of **sodium bromide** may be given every 3 or 4 hours. Morphine should not be used, nor quinine on account of its hemolytic properties. Small doses of **digitalis** are usually needed during the attack.

camphor in, vi. 536
champagne in, vi. 536
diet in, v. 411
digitalis in, vi. 536
endophleboclysis in, vi. 536
external heat in, vi. 536
Hearsey's treatment in, vi. 536
hyperisotonic alkaline saline solution in, vi. 536
hypodermoclysis in, vi. 536
ice in, vi. 536
mercury bichloride in, vi. 536
methylene blue in, v. 411; vi. 536
morphine in, vi. 536
nitroglycerin in, vi. 536
musk in, vi. 536
nutrient enemata in, vi. 536
opium in, vi. 536
pituitary preparations in, vi. 536
quinine in, v. 404, 411; vi. 536
rest in bed (absolute) in, vi. 536
salt solution in, v. 411; vi. 536
salvarsan in, vi. 536
sodium bicarbonate in, vi. 536
strychnine in, vi. 536
thyroid preparations in, vi. 536
Warburg's tincture in, vi. 536
wet cups in, v. 411
paroxysmal, v. 402, 403, 404, 407, 408, 409, 411
arsenic in, v. 411
bed in, v. 411

Hemoglobinuria, paroxysmal (*continued*).
  calcium salts in, ii. 717, 718, 719; v. 411
  change of climate, v. 411, 412
  cholesterin in, v. 412
  diet in, v. 411
  iron in, v. 411
  quinine in, iii. 379; v. 411
  warm shower baths in, v. 412
 prophylaxis, v. 411
  avoid cold, v. 411
  diet, v. 411
  flannel underwear, v. 411
  iron, v. 411
  tonics, v. 411
  warm climate, v. 411
 syphilitic, v. 405, 411
Hemoglobinuric fever, quinine in, iii. 379
  bilious, calcium chloride in, ii. 719
Hemol, vi. 76
Hemolysis in hemoglobinuria, v. 406, 407, 408, 409
 in Wassermann reaction, v. 385
Hemopericardium, v. 288
  aspiration in, v. 288
Hemophilia, v. 412

Studying the platelets in 2 cases, Minot and Lee (Arch. of Internal Med., Oct., 1916) were impressed with their essential rôle in hemophilia. Whereas addition of normal platelets to hemophilia plasma caused it to coagulate in normal time, hemophilic platelets, added in amounts 75 times as large, never reduced the coagulation to anywhere near normal. The delay in coagulation in hemophilia occurs in the initial step in clotting, which seems to be a rendering of the platelets available by some process resembling solution. In 1 patient transfusion of 600 c.c. of normal blood reduced the clotting time from 60 to 7 minutes, but gradual retardation then took place in 3 days.

 and adenoid vegetations, i. 408
 and hematuria, v. 398, 399
 and marriage, v. 415, 418
 and pregnancy, v. 413
 blood-picture in, v. 415, 416
 prophylaxis, v. 417
  avoid exciting factors, v. 417
  avoid violent exercise, v. 418

According to Fonio (Deut. med. Woch., Nov. 2, 1916), a single intravenous treatment with his extract of blood-platelets may result in a permanent cure.

  diphtheria antitoxin, v. 419
  ferratin, v. 418
  hydrastis, v. 418
  iron perchloride, v. 418

Hurwitz and Lucas (Arch. of Internal Med., Apr., 1916) state that kephalin, applied locally, promptly arrests bleeding in hemophilics.

  saline purgatives, v. 418
  strychnine, v. 418
  thymus gland, v. 418
  thyroid gland, v. 418
 treatment, v. 419
  actual cautery in, v. 424
  adrenal products in, v. 423, 424
  atropine in, ii. 451
  blood (normal) in, v. 419, 421; viii. 805
  blood-serum in, v. 419, 420, 421, 422
  calcium salts in, ii. 717, 718, 719
  defibrinated blood in, v. 421, 422
  diphtheria antitoxin in, v. 418, 419, 420
  gelatin (sterile) in, v. 15, 422, 423, 424
  goiter tissue (fresh) in, v. 422
  iron in, v. 424; vi. 89
  kneading of tissues in, v. 419, 421
  meat (fresh) juice in, v. 419
  morphine in, v. 419
  oxygen inhalations in, v. 424
  peptones in, v. 423
  pituitary gland in, v. 424
  pressure in, v. 419
  propeptone in, v. 423
  rabbit liver (fresh) in, v. 420
  recumbent posture in, v. 419
  rest and bandage to joints in, v. 424
  strychnine in, vii. 147
  styptics in, v. 419
  thermocautery in, v. 424
  thyroid gland in, i. 738; v. 424
  tissue juice in, v. 419, 420, 422
  turpentine in, viii. 635
Hemoptysis, vi. 444; see also Lungs, Hemorrhage of, this Index.
 tuberculous, see Tuberculosis, Chronic Pulmonary, viii. 597
Hemorrhage, viii. 799; see also various conditions in which it occurs.

S. H. Hurwitz (Jour. Amer. Med. Assoc., Mar. 3, 1917) uses Locke's solution containing 2 per cent. of

acacia for intravenous injection to combat low blood-pressure from hemorrhage. The solution is filtered and sterilized. Owing to the colloidal acacia, this solution does not rapidly pass out of the blood-vessels. Small injections will restore blood-pressure to normal and maintain it much longer than ordinary saline.

adrenal gland in, i. 765, 769, 770
adrenalin in, i. 773; viii. 799
alcohol in, i. 525
atropine injections in, viii. 799
autotransfusion in, viii. 799

In severe hemorrhages into the thoracic and abdominal cavities K. Henschen (Zentralbl. f. Chir., Nu. 10, 1916) **reinfuses** the **blood** remaining fluid in these cavities into the vessels of the patient. The fluid blood is drawn off by a metallic paraffinated ladle, filtered through sterile gauze impregnated with liquid paraffin, and gathered into a glass receptacle similarly coated. **Sodium citrate** is added, 0.2: 100 c.c. After dilution with **salt** or **Ringer's solution,** the fluid is injected with an ordinary infusion apparatus.

The prophylactic value of **normal blood-serum,** according to H. H. Forbes (Annals of Otol., Rhin. and Laryn., Mar., 1916), is obtained 24 to 48 hours after its injection, and persists for at least 3 weeks. The serum is most active if allowed to clot in the test-tube. Human serum acts to advantage by protecting against anaphylaxis. Serum older than 2 days should not be used. **Precipitated blood-serum** in a powder yielded good results in hemorrhages after tonsillectomies and turbinectomies

blood transfusion in, viii. 799, 805

The most efficient method of using **blood** in hemorrhage, according to H. R. Oliver (Calif. State Jour. of Med., Jan., 1917), is to obtain 20 c.c. of blood from the veins of a healthy person with a Luer syringe, and inject it immediately into the gluteal muscle of the patient. This is not painful, and leaves no bad results. In 6 cases of melena neonatorum a single injection was curative. It was also used in duodenal ulcer after failure of lactates, horse serum, etc., with complete success; likewise in hemorrhage with purpura in pulmonary tuberculosis.

calcium lactate in, ii. 717, 718

H. L. Cecil (Jour. Amer. Med. Assoc., Feb. 24, 1917) found **cephalin** of value in deep bleeding after prostatectomy or Young's median bar excision. For the former, he uses gauze impregnated with a 5 per cent. ethereal solution of it and sterilized at 120° C. After the Young operation, cephalin-coated coudé catheters are used satisfactorily, prepared by slowly dropping on them, while slowly rotated, the same solution to form a coating 1 or 2 millimeters thick.

clothes to be loosened in, viii. 799

In 5 cases of hemorrhage in diseases of the liver with jaundice, Z. W. Ogloblina (Roussky Vratch, Sept. 24, 1916) found the blood coagulability, very low before injection of **coagulose,** markedly increased by it. It is a valuable agent in preventing post-operative hemorrhage in cases of this type.

cocaine in, iii. 483
digitalis in, iv. 158; viii. 799
emetine hydrochloride in, vi. 60
enemata of hot coffee and brandy in, viii. 799
ergot in, iv. 571
erigeron in, iv. 572
ether injections in, viii. 799
eucalyptus oil in, iv. 706
gelatin in, v. 15
hamamelis in, v. 161
head to be low in, viii. 799
heart massage in, iii. 196
hot-water bottles in, viii. 799
hydrogen dioxide in, v. 572
ipecac in, vi. 59
morphine in, vii. 188

In stopping hemorrhage in such organs as the kidney and liver, when other forms of hemostasis are impossible or undesirable, Risley (Surg., Gynec. and Obstet., Jan., 1917) found **muscle tissue** the ideal hemostatic.

It should be cut jaggedly with a knife and not left in contact with salt solution. Fascia and fat act less powerfully as hemostatics, though in the liver both seem at times very efficient. They unite with the bleeding surface and form a smooth, solid scar.

- **oxygen inhalations** in, vii. 274
- **quinine** in, iii. 390
- **saline solution, normal,** in, viii. 196, 799
- **strychnine injections** in, viii. 799
- **tannic acid** in, viii. 498

According to A. F. Hess (Jour. Amer. Med. Assoc., Dec. 9, 1916), **thromboplastin,** a solution and fine suspension of ox brain in normal salt solution, with 0.3 per cent. of tricresol as preservative, is of great value whenever it is brought in contact with a bleeding area, *e.g.,* after removal of tonsils and adenoids, in nasal work, circumcision, extraction of teeth, etc. In hemophiliacs it is almost a specific. Where not effective in local hemorrhage, it may be injected into the site of hemorrhage in a 1 per cent. solution, boiled for a brief time. In a solution, a powder diluted with lactose, or an ointment, it markedly stimulates healing of chronic and indolent wounds, such as varicose ulcers.

- **warm blankets** in, viii. 799

adrenal, see Hyperadrenia, Acute, i. 440; also Adrenals, Diseases of, this Index.
after tooth extraction, **cotarnine hydrochloride** in, iii. 675
amaurosis following, i. 594
bronchopulmonary, see Lungs, Hemorrhage of, vi. 644; also this Index.
capillary, viii. 799
- **hamamelis** in, v. 161
- **hydrastis** in, v. 546
- **sodium sulphate** in, viii. 190

cerebral, see Cerebral Hemorrhage, iii. 83; also this Index.
consecutive, viii. 799
due to myomata or ovarian cysts, **pituitrin** in, i. 779
due to threatened abortion, **cotarnine hydrochloride** in, iii. 675
extradural, see Extradural Hemorrhage, v. 192; also this Index.

Hemorrhage (*continued*).
from leech-bites, **silver nitrate** in, viii. 136
from mucous membrane, **nitric acid** in, vii. 46
gastric, see Stomach, Hemorrhage From.
in abdominal injuries, **saline solution** in, i. 145
in adnexal inflammatory diseases, **pituitrin** in, i. 779
in the newborn, spontaneous, vii. 35
- **blood-serum** in, vii. 37, 38, 39
- **blood-transfusion** in, vii. 37, 39, 40, 41; viii. 805

A. Brown (Can. Med. Assoc. Jour., vi. 716, 1916) advocates **blood transfusion** in all hemorrhages of the newborn. The danger from hemolysis is overrated. Fifteen c.c. per pound of weight is a safe amount to inject.

- **breast milk given cold** in, vii. 41
- **calcium acetate** in, vii. 38

In gastro-intestinal hemorrhage in the newborn Triollet (Arch. mens. d'Obstét. et de Gynéc., v. No. 10-12, 1916) states that at the Tarnier maternity a combination of **calcium chloride** by mouth with subcutaneous injections of **gelatinized serum** has proven very effectual. Every 2 hours a teaspoonful of a 2 per cent. solution of calcium chloride, to a total of 1 or 2 Gm. (15 to 30 grains) a day, is given, also in the scapular region a daily subcutaneous injection of 20 c.c. (5 drams) of gelatinized serum sterilized for 30 minutes at 120° C. A few teaspoonfuls of boiled water every 2 hours are given. The child is kept warm with hot water bottles. Later breast feeding is cautiously resumed. On suspicion of syphilis, specific treatment is given.

- **diphtheria antitoxin** in, vii. 38
- **gelatin** in, vii. 40, 41
- **heart stimulants** in, vii. 41
- **Lindeman's method** in, vii. 39
- **lumbar puncture** in, vii. 41
- **puncture of fontanel** in, vii. 41
- **quiet** in, vii. 41
- **rabbit serum** in, vii. 37, 41
- **saline infusion** in, vii. 41
- **surgical measures** in, vii. 37

Hemorrhage in the newborn (*continued*).
Vincent's method in, vii. 40
warmth in, vii. 41
Welch's method in, vii. 38
intermediary, viii. 799
internal, **atropine** in, ii. 450
intestinal, **atropine** in, ii. 451
calcium lactate in, ii. 717
gallic acid in, iv. 793
gelatin in, v. 15
kino in, vi. 235
krameria in, vi. 237
intracranial, blood-pressure in, ii. 493
traumatic, v. 191
local, **antipyrin** in, ii. 46
creosote water in, iii. 689
nasal, see Epistaxis, iv. 558; also this Index.
of bladder, see Bladder, Hemorrhage, this Index.
of brain, see Cerebral Hemorrhage, iii. 83; also this Index.
of placenta previa, **pituitary** in, i. 779
of scurvy, **ergot** in, iv. 572
of thymus, focal, viii. 534
of toxemia, **gelatin** in, v. 15
of typhoid fever, see Typhoid Fever, Hemorrhage of, this Index.
pancreatic, vii. 279
parenchymatous, **hydrogen dioxide** in, v. 568
post-abortum, **atropine** in, ii. 451
iron in, vi. 89
post-partum.

In severe post-partum hemorrhage due to sudden uterine relaxation after expulsion of the placenta R. K. Howat (Brit. Med. Jour., Feb. 5, 1916) makes pressure over the abdominal aorta, then rapidly changes the position of his hand to grasp the fundus. With the other hand in the vagina, a bimanual anteflexion of the fundus and cervix is carried out, pressing the uterine walls together between the 2 hands. Immediately after, the pelvis is lifted by an assistant and placed in an exaggerated Trendelenburg position by means of an inverted chair. When the uterus is firmly contracted, the vaginal hand is withdrawn, and a vulvar dressing and firm abdominal binder applied. Elevation of the pelvis to 30° should be maintained for at least 7 hours.

Hemorrhage, post-partum (*continued*).
atropine in, ii. 451
cannabis indica in, iii. 7
cotarnine phthalate in, iii. 676
ergot in, iv. 565
iodine tincture in, vi. 42
nux vomica in, vii. 151
pituitrin, in threatened, i. 778
quinine in, iii. 390
pulmonary, vi. 444; also Lungs, Hemorrhage of, this Index.
reactionary, viii. 799
recurrent, viii. 799
renal, **ergot** in, iv. 572
physostigma in, vii. 460
retinal, vii. 198
secondary, viii. 799
blood transfusion in, viii. 805
turpentine in, viii. 634
subcutaneous, **ergot** in, iv. 572
subdural, v. 190
subhyaloid, vii. 198
uterine, see Uterus, Hemorrhage of, this Index.
venous, viii. 799
Hemorrhagic cysts of the spleen, viii. 315
diathesis, **sodium sulphate** in, viii. 190
measles, **turpentine** in, viii. 635
pseudocysts of the adrenals, i. 453; see also Adrenals, Diseases of, this Index.
septicemia, viii. 821
Hemorrhoids, v. 424
adrenalin solution in, i. 773, 774; vi. 238
aloes in, i. 570
aluminum borotannate in, i. 589
anesthesin in, i. 665; v. 432
belladonna in, ii. 444, 449; viii. 502
Bier's hyperemia in, v. 441, 597, 598
calcium creosote in, iii. 687
castor oil in, iii. 16; v. 440, 447
cocaine in, iii. 481, 484, 490, 499; vi. 238
cocaine cataphoresis in, iii. 499
excision of, **cocaine** in, iii. 484
gallic acid in, iv. 793
gelatin in, v. 15
glycerin in, v. 29
hamamelis in, v. 161
hematoxylon extract in, v. 394
hydrastis in, v. 548
hyoscyamus in, v. 579
ichthyol in, v. 639
jalap in, vi. 91
krameria in, vi. 238
linseed oil in, vi. 365

Hemorrhoids (*continued*).
  magnesium sulphate in, vi. 475
  novocaine anesthesia in, vii. 103, 107
  olive oil in, v. 432, 433, 439, 440; vii. 170
  orthoform in, vii. 216
  perineal douche in, viii. 811
  phenol injections in, vii. 443

Injections into each internal pile of a few drops of the following solution is advised by A. S. Morley (Lancet, Mar. 18, 1916):—

Phenol	3 Gm. (48 grains).
Glycerin, *Distilled water,* of each	8 Gm. (2 drams).

The amount for each pile varies from 2 to 6 minims (0.12 to 0.36 c.c.). Injecting too much may produce slight sloughing, which causes pain. The injection can easily be repeated if necessary. Usually all the piles can be injected at 1 sitting, but sometimes after injection a large pile swells so rapidly that the smaller piles are completely hidden.

Before injection, the piles may be sponged over with a little weak biniodide of mercury or 1/50 lysol solution, to be mopped up at once with a dry swab. Each pile may be touched, where to be injected, with pure phenol. The patient should keep quiet for the first 12 to 24 hours, and wash the piles at once with cold water should they prolapse, grease them, and gently press them back. Where they are large, 4 or 5 weekly injections may be rquired, but usually 2 or 3 suffice.

  potassium bitartrate in, vii. 580
  potassium chlorate in, vii. 583
  quinine and urea hydrochloride anesthesia in, iii. 393, 395
  stillingia in, viii. 324
  stramonium ointment in, viii. 407
  sulphur in, viii. 428
  tar in, viii. 502
 bleeding, calcium chloride in, ii. 719
  chromium in, iii. 337
  ergot in, iv. 572
  iron subsulphate in, vi. 89
  nitric acid in, vii. 46
  podophyllum in, vii. 567

Hemorrhoids, bleeding (*continued*).
  tannin suppository in, viii. 498
 congested, leeching in, vi. 314
 external, v. 427
  acetanilide in, v. 433
  adrenalin in, v. 433
  alum in, v. 432
  argyrol in, v. 432
  balsam of Peru in, v. 432
  belladonna in, v. 432
  bismuth subsalicylate in, v. 432
  boric acid in, v. 431, 432
  calomel in, v. 433
  camphor in, v. 432
  cascara in, v. 433
  chrysarobin in, v. 432
  cold-water injections in, v. 433
  diet in, v. 431, 432
  divulsion of sphincters in, v. 433
  excision of inflamed crypts in, v. 432
  ichthyol in, v. 432, 433
  iodoform in, v. 432, 433
  lead water and laudanum in, v. 432
  removal of tags in, v. 433
  silver (colloidal) in, v. 433
  surgical measures in, v. 434
  talcum in, v. 431
  wet dressings in, v. 432
  zinc oxide in, v. 432, 433
 in pregnancy, vii. 612
  rhubarb in, viii. 30
 internal, v. 435
  aluminum acetate in, v. 441
  Ball's operation in, v. 444
  Boas's method in, v. 441
  boric acid in, v. 440, 444, 445
  calcium chloride in, v. 441
  calomel in, v. 447
  carbolic acid in, v. 442, 443
  carbon dioxide (solid) in, v. 439

Good results are stated by J. A. Hawkins (Jour. Amer. Med. Assoc., May 27, 1916) to follow cauterization of internal hemorrhoids, bleeding spots in the rectum, and villous tumors, with the high frequency current (single pole) under cocaine or alypin anesthesia. At each sitting 1 tumor is thoroughly burned, and 1 or 2 others lightly done. The burned area is then painted with liquid petrolatum or oil of eucalyptus (1 in 8 of oil), and 2 weeks allowed before the next cauterization.

Hemorrhoids, internal (*continued*).
  clamp and cautery in, v. 442, 443, 445
  compress in, v. 440, 445
  diet in, v. 429, 440
  divulsion of sphincter in, v. 438, 439
  enemata in, v. 439, 440
  excision of pile in, v. 442, 446, 447, 449
  hot-water bag in, v. 440
  ichthyol in, v. 439, 440, 443
  injection of pile in, v. 442
  laxatives in, v. 439, 444
  ligation of pile in, v. 442, 443
  morphine in, v. 444
  palliative measures in, v. 439
  Paquelin cautery in, v. 445
  potassium permanganate in, v. 447
  pressure in, v. 440

Injection of quinine and urea hydrochloride solution is deemed safe and efficient in selected cases by E. H. Terrell (Trans. Amer. Proct. Soc., June, 1916). In 2 years 127 cases of uncomplicated internal hemorrhoids were treated with but 1 failure. The quinine and urea in 5 to 20 per cent. solutions produces starvation and atrophy of the hemorrhoids.

  replacement of tumor in, v. 440
  silver nitrate in, v. 440, 443
  sodium bicarbonate in, v. 445
  surgical measures in, v. 440, 441-449
  thymus gland in, v. 440
  Tuttle's operation, v. 446
  wet dressings in, v. 440
  Whitehead's operation in, v. 446-449

F. M. Bell (Brit. Med. Jour., Mar. 18, 1916) describes an operation suitable in the same cases as Whitehead's operation, but almost bloodless, and less liable to complications. After dilatation, a silk suture is passed at junction of skin and mucosa in the midperineal line, and one on either side of the anus. When traction is made on all 3 the extruded mucosa is triangular. The sides of the triangle are successively clamped and dealt with. Two Hagedorn needles are threaded at either end of a silk suture. The first stitch is placed at the apex of the triangle and tied at the center of the thread. The clamp being removed, the 2 needles are passed through from opposite sides at the same points (cobbler's stitch). Each stitch is pulled taut but not tied. The suture is continued at ¼ inch intervals until the lower end of this side of the triangle is reached, where it is tied. The redundant tissue is clipped away 1/16 inch from the line of suture, and the narrow ridge thus left lightly touched with the thermocautery. The other 2 sides of the triangle are similarly treated. In 21 cases this operation gave satisfactory results.

  zinc oxide in, v. 449
Hemostasis in abdominal surgery, i. 27
Hemothorax, iii. 159; vii. 524

Elliott and Henry (Brit. Med. Jour., Apr. 7, 1917) found infection by anaërobic bacilli in about 10 per cent. of all cases of hemothorax from chest gunshot wounds seen in base hospitals in France. In most cases septic features are more prominent than gas formation, the most serious being jaundice, a rapid pulse (which may presage pericarditis), and semidelirium. Less dangerous is the febrile type with brilliant hectic flush. The diagnosis depends on exploratory puncture. In cases clinically septic it may be necessary to repeat the exploration on successive days, the anerobic bacilli frequently failing to spread at once throughout the hemothorax, so that they are missed at first. Life can be saved in at least ⅘ of cases if the infected blood is promptly drained away.

  aspiration in, iii. 160

Bradford and Elliott (Brit. Jour. of Surg., Oct., 1915) state that in the campaign in Flanders hemorrhage appeared to be, and sepsis undoubtedly was, much more serious in the prognosis of chest wounds than in the South African campaign. Death from simple hemorrhage is not to be feared if the patient survives to the third day. Of 328 cases of hemothorax seen during life, 211 were sterile, and 89 of these so large as to need aspiration; 117 were septic. Death occurred in 47, of which 36 were septic. Sterile hemothorax may disable a patient by prolonged fever, dyspnea, or progressive collapse of the chest wall. Absorption is slow. Hence free fluid should be removed whenever the effusion exceeds 20 or 30 ounces—that is, where the dullness reaches half-way up the scapula. The 7th to 10th day is convenient for aspiration provided fresh hemoptysis has ceased. A massive clot is uncommon. The needle should be introduced well forward in the axilla at the anterior limit of the effusion, and high up. If discomfort is noted, oxygen should be introduced. The gas is adequately sterilized by passage through a bacterial trap formed by 3 narrow loops on an open glass tube, the inner surface of which remains wet after boiling.

Among the septic cases, the pneumococcus, tetragenus, and influenza organisms were found in about 20 per cent. The remainder had all been infected externally, either with streptococci or anerobic gas-producing bacilli of fecal origin. The latter were found in nearly half the infected cases, and give an extremely offensive odor to aspirated fluid. The chest should be opened as soon as infection is proven. Resection of a rib yields fair results. All patients traced recovered after this treatment.

    conservative measures in, iii. 160
    intratracheal insufflation in, vii. 524
    ligature in, vii. 524
    morphine in, iii. 160
    opiates in, vii. 524
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    splinting in, iii. 160
Henbane, see Hyoscyamus, v. 575
Henpue, see Goundou, v. 75
Henrotin's gag, v. 800
Hepatalgia, strychnine in, vii. 151
Hepatectomy, i. 101
Hepatic abscess, see Liver, Abscess of, vi. 400; also this Index.
  atony, chirata in, iii. 199
    gray powder in, vi. 671
  cirrhosis, see Cirrhosis of the Liver, iii. 396; also this Index.
  colic, see Liver, Colic of, this Index.
  congestion, see Liver, Congestion of, vi. 370; also this Index.
Hepatic congestion (*continued*).
    mercurial injections in, vi. 682
    sodium chloride waters in, vi. 711
  disorders, see Liver, Diseases of, vi. 368
  insufficiency, see Liver, Insufficiency of, this Index.
  organotherapy, i. 795
  torpor, see Liver, Torpidity of, this Index.
Hepatitis, veratrum in, viii. 807
  acute parenchymatous, see Liver, Acute Atrophy, vi. 397; also this Index.
  amebic, emetine in, iv. 448, 451
  chronic, gold in, v. 74
  diffuse, Bier's hyperemia in, v. 595
  suppurative, see Liver, Abscess of, vi. 400; also this Index.
Hepatopexy, iii. 456
Hepatoptosis, see Visceroptosis, v. 770; also this Index.
  surgical treatment of, i. 97
Hepatotomy, iii. 455
Hereditary ataxia, viii. 245
    arsenic in, viii. 247
    celibacy in, viii. 247
    Fränkel method in, viii. 247
    selected occupation in, viii. 248
    suspension in, viii. 247
  chorea, iii. 332
  tremor, viii. 578
Hermaphroditism.

Blair Bell (Lancet, May 22, 1915) states that all cases with ovotestes reported have shown predominating feminine characteristics. His patient had had regular menstruation until 18 months after puberty, when masculine characteristics developed, including a bass voice and much hair on the body, with masculine distribution. At first, suspecting suprarenal hyperplasia, the patient was given ovarian and thyroid extracts. Finally the gonads, tubes, and fundus uteri were removed, showing the left gonad to be an ovotestis.

Hernia, v. 449

König (Deut. med. Woch., Jan. 4, 1917) has been impressed by the remarkable frequency of hernia in wartime, probably because of loss of adipose tissue, together with the greater amount of roughage in the bowels, and often the unaccustomed physical labor for those past youth. The number of cases of incarcerated hernia is also greater. Femoral hernias have increased out of all proportion, and gangrene develops exceptionally rapidly after incarceration. Thirty-four died out of the abdominal wall hernias forming 11.5 per cent. of Riedel's total 550 hernia cases. The unusual prevalence of abdominal wall hernias is attributed to the stronger peristalsis caused by the war diet.

  novocaine anesthesia in, vii. 103
  stovaine anesthesia in, viii. 398
appendicitis and, v. 469
cecal, v. 491
  Berger's operation in, v. 492
cerebri, v. 171
chronic, v. 455
diaphragmatic, v. 492

Among recent operated cases of diaphragmatic hernia, J. F. Mitchell (Trans. So. Med. Assoc.; N. Y. Med. Jour., Apr. 21, 1917) found 10 recoveries in 11 operations. Thus, operation under present methods offers an excellent chance of success. In acute injuries, the abdominal route permits better inspection and safer repair of wounds of the abdominal viscera. The thoracic route is indicated in recent stab wounds of the chest. Simple enlargement of the wound with resection of a rib or 2 may prove sufficient for replacing the displaced organs and repairing the diaphragm.

  anterior gastroplication in, v. 495
  approximation of ribs in, v. 493
  gastroenterostomy in, v. 495
  layer suture of diaphragm and intercostal muscle in, v. 493
  plastic closure in, v. 493
  transpleural route, operation by, v. 494
epigastric, v. 490
  exploratory laparotomy in, v. 491
  paraffin injection in, v. 491
  radical operation in, v. 491
  reduction and retention in, v. 490
  rubber pad in, v. 491
femoral, v. 481

According to Caput (Rev. de gynéc., xxiii, 431, 1916), most operations for large femoral hernias are inefficient. Sutures being useless for obliteration of the femoral ring, he closes it with a pedunculated strip of fat sutured to its margins. The strip is about 2 fingers wide and 10 cm. long, and its base corresponds to the pubes and the inner border at the median line. Dissection is carried as far as the aponeurosis. The rectus is incised, the peritoneum stripped from the wall, and the graft introduced and sutured posteriorly to Cooper's ligament behind the femoral vein, and anteriorly to the femoral ring in front of the vein. In the writer's 5 cases the flap healed in place, and the hernia was completely corrected.

  Bardescu's groin operation in, v. 483
  Bassini's operation in, v. 483
  Dujarier's technique, v. 484
  Exalto's technique, v. 481
  Noble's technique, v. 484
  novocaine anesthesia in, vii. 107
  Ochsner's technique, v. 483
  Pilcher's technique, v. 484
  purse-string suture in, v. 482
  taxis in, v. 482
  truss in, v. 482
gluteal, v. 496
incarcerated, v. 465, 496
  digitalis in, iv. 158
  hyoscyamus in, v. 579
  resection of bowel in, v. 465
inguinal, congenital, v. 449, 455

In oblique inguinal hernia *in infants* W. A. Robertson (West. M. News, ix, 17, 1917) makes a small incision 1 inch over the external abdominal ring, raises the cord with the finger, and makes an incision through its coats, intercolumnar, cremasteric, and transversalic. He separates the sac well, especially above; draws down after opening it, transfixes and ties off. The reduced portion is cut off and allowed to retract up the canal. If it is a congenital case, he merely ties off the sac above the testicle and below at the external ring; a few horse-hair stitches are all that is required. If the sac is not found beneath the external ring, he cuts the aponeurosis of the external oblique. This is then sutured with catgut. The patient should be on his back for 2 or 3 weeks. A truss may be worn afterward if there is much coughing or vomiting. With this operation little catgut is left in the wound to cause trouble.

bandage or strapping in, v. 455
diet in, v. 455
ginger and peppermint in, v. 455
inverted position in, v. 455
novocaine anesthesia in, vii. 107
removal of sac in, v. 457
replacement in, v. 455
rhubarb and soda in, v. 455
truss or pad in, v. 455, 457

inguinal, in female, v. 479
Championnière's technique, v. 480
Coley's operation in, v. 480

inguinal, in male, v. 469

After returning a large hernia, Städtler (Med. Klinik, Oct. 8, 1916) runs 3 rows of a purse-string suture around the hernial opening in the fascia. Tying them separately, a pad is produced which protects against recurrences.

Extensive experience with indirect inguinal hernias in war cases has convinced Hoepfl (Münch. med. Woch., Dec. 12, 1916) of the advantages of slitting the hernial sac crosswise and leaving the lower half. The sac is incised about on a level with the anterior inguinal ring, aiding reduction by raising the pelvis. The ends of the incision are then drawn apart with forceps, bringing up the posterior wall of the hernial sac in a transverse fold, which is then slit longitudinally. The cut edges being raised with forceps, the upper half of the sac is separated from adhesions down into the internal ring. It is sutured to close it, and then allowed to slide back; the operation is completed with Bassini's or Girard's technique.

Andrew's Operation.—This is characterized by imbrication of the layers of the abdominal wall. In a similar technique employed by F. T. Stewart, after the internal ring has been made snug by passing sutures through the transversalis fascia, the canal is closed above the cord by suturing the transversalis and internal and external obliques as one layer to Poupart's ligament, the external oblique fascia thus reinforcing the subjacent muscle tissues. The needle is passed through these structures from without inwards, then through the ligament from within outward, a finger meanwhile protecting the femoral vessels. For precise coaptation and greater strength, deep and superficial sutures are alternately introduced. The lower flap of the external oblique is then carried up over the upper flap, sutured to it, and the skin incision closed.

Bassini operation in, v. 469, 470, 476

A weak point left by the Bassini technique is eliminated by Seitz (Münch. med. Woch., Jan. 2, 1917) by slitting the hernial sac, spreading it out, and suturing it over the gap. The neck of the sac is ligated and cut off close.

Berger's technique, v. 469
Bull and Coley's technique, v. 471, 475
cocaine anesthesia in, iii. 469
Coughlin and Young's technique, v. 469
Deansley's technique, v. 473
Ehler's technique, v. 473
filigree implantation in, v. 472, 474

Ferguson's Operation.—This procedure is planned to prevent recurrence due to deficient natural attachment of the internal oblique and transversalis muscles to Poupart's ligament. The incision is semilunar, with convexity upward, beginning over Poupart's ligament, 1½ inches below the anterior superior spine, and ending near the pubis, over the conjoined tendon. The external abdominal ring is then incised to the intercolumnar fascia, and the longitudinal fibers of the external oblique separated over the inguinal canal to beyond the internal ring. The hernial sac having been separated from the cord and internal ring, it is opened, tied high up and cut off, and its stump dropped into the abdominal cavity. The spermatic cord is left untouched unless there is varicocele. Removal of any excess of subserous fat is recommended. In

bringing back the various structures to their normal situations, care is taken to tighten down the stretched transversalis fascia over the cord by means of a continuous or interrupted suture, thus reducing internal ring to small size. The lower margins of the internal oblique and transversalis muscles are then freshened, Poupart's ligament scarified, and the muscles sutured to the ligament two-thirds of the way down the latter. Finally, the external oblique aponeurosis is sutured, restoring the external ring, and the skin incision closed.

Halsted's technique, v. 470, 471

Halsted's Operation.—In the newer technique of this operation, incision of the skin and external oblique aponeurosis is first effected as in the Bassini operation. The cremaster muscle and fascia are then incised and the internal oblique muscle exposed. Large veins, if found, are removed after ligation well up in the abdomen, and well above the testicle, but the vas deferens is allowed to remain in its bed. After ligation or purse-string suturing of the hernial sac the latter is pulled outward beneath the internal oblique with a long curved needle attached to the ligating sutures, and the ends of these sutures tied together over a narrow portion of the muscle. The lower flap, consisting of cremaster muscle and fascia, is then carried beneath the internal oblique and sutured, the internal oblique and conjoined tendon next sutured to Poupart's ligament, with the margin of the former tucked under the ligament, the external oblique then closed with sutures, and the incision in the skin finally closed.

Kirchner's technique, v. 474
Kocher's technique, v. 476
Lorthioir's technique, v. 470
McGavin's technique, v, 472
novocaine anesthesia in, vii. 107
quinine and urea hydrochloride anesthesia in, iii. 394
radical operation, dangers and complications of, v. 476
removal of sac necessary in, v. 472, 473

Hernia, inguinal, in male (*continued*).
  results of operation for, v. 474

Analyzing 1500 cases of inguinal hernia operated upon at the Massachusetts General Hospital from 1908 to 1914 by 75 different operators, including residents, Lincoln Davis (Jour. Amer. Med. Assoc., Aug. 12, 1916) found that in the 1388 male cases the Bassini technique was used 834 times, the Ferguson 764, the Halsted 15, and 24 miscellaneous. Among the complications were sepsis in 178 cases; hematoma, 112, and respiratory affections, 138. The operation had a mortality rate of 0.53 per cent., and should not be undertaken in the old and infirm without good reason. Postoperative cough, hematoma, and sepsis are factors in recurrence, the latter less important than is generally supposed. Many patients anatomically cured complained of pain. Local anesthesia is widely applicable where inhalation anesthesia is contraindicated, but carries a slightly greater risk of sepsis.

  Roughton's technique, v. 475
  Torek's technique, v. 470
  Zesas's technique, v. 473
inguinal, incomplete, v. 454
interstitial, v. 495
into a rent of the omentum, i. 17
into foramen of Winslow, v. 496
  enemata in, v. 496
into supravesical space, v. 498
irreducible, v. 457
  dorsal decubitus in, v. 458
  ice-bag in, v. 458
  Mayo's operation in, v. 458
  radical operation in, v. 457
  taxis in, v. 458
  truss with concave pad in, v. 457
ischiatic, v. 496
labial, v. 496
local anesthesia in, iii. 394, 469, 484, 495, 499; v. 477, 478, 486
lumbar, v. 495
  reduction and retention in, v. 495
  surgical measures in, v. 496
obturator, v. 497
  herniotomy in, v. 497
  laparotomy in, v. 498
  Lejars's technique in, v. 497

Hernia, obturator (*continued*).
    taxis in, v. 497
  of the bladder, v. 478; viii. 723
    Edebohls's method in, viii. 771
    hexamethylenamine in, v. 479
    surgical measures in, v. 479
  of the lung, iii. 125
  of the muscles, v. 498; vi. 765
    closure of fascia in, v. 498
    plastic operation in, v. 498
    suture of muscles in, v. 498
    tendon transplantation in, v. 498
  of the ovary, vii. 238
  of the vagina, viii. 773
  of the vulva, viii. 774
  perineal, v. 496
    radical operation in, v. 496
  pneumonia from anesthetic in, v. 476
  properitoneal, v. 490, 495
    in abdominal surgery, i. 17
  pudendal, v. 496
  radical cure of, v. 468-479, 482-484, 488-490, 492, 496-498
  rare forms of, v. 492
  recently acquired, v. 455
    truss after reduction in, v. 455
  reducible, v. 454
    removal of sac in, v. 457
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    Kirchner's technique, v. 474
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    anastomosis of bowel in, v. 465, 466
    anesthesia in, iii. 394, 469, 484, 495, 499; v. 463, 477, 478, 486
    artificial anus in, v. 466
    atropine in, v. 463, 464
    bowel contents, management of, in, v. 464
    division of constriction in, v. 464
    ether anesthesia in, v. 463
    gangrenous bowel, management of, in, v. 464-468
    hot cloths in, v. 463
    hyoscine and hyoscyamine in, v. 463
    ice-bag in, v. 463
    iced compresses in, v. 463
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    iodoform gauze in, v. 465
    morphine in, v. 463
    relaxation of abdomen in, v. 463
    resection of intestines in, v. 465, 467
    scopolamine in, v. 463

Hernia, strangulated (*continued*).
    strychnine in, v. 464
    surgical measures in, v. 464-469
    taxis in, v. 461
    two-stage operation in, v. 466
    vitality of bowel, test of, v. 465
  umbilical, adult, v. 487

Tracing the end results in 70 cases of umbilical hernia operated on at the Massachusetts General Hospital, C. C. Simmons (Boston Med. and Surg. Jour., Mar. 9, 1916) asserts that small umbilical hernias in thin adults, and umbilical hernia in children, may be cured by any operation which removes the sac and closes the defect in the abdominal wall. No recurrence was noted among 15 such cases. In umbilical hernia in stout adults, the Mayo operation gives the best results. Closure of the ring by any other method than the Mayo, in a general hospital, is followed by 46.4 per cent. of recurrences. Recurrence usually occurs in less than a year.

Attention is called by Walter Lathrop (Jour. Amer. Med. Assoc., Aug. 12, 1916) to the value of combining the radical cure of umbilical hernia with excision of fat. The average amount removed in his cases was 5½ pounds, and sometimes 20 pounds. Careful hemostasis is necessary, and drainage must be provided at both ends of the incision. The patient must rest in bed from 18 to 35 days after the operation.

    broad belt with pad in, v. 487
    Coley's technique in, v. 488
    collodion in, iii. 536
    early operation in, v. 487
    ethyl chloride in, v. 488
    Kelly's technique in, v. 489
    Mayo's technique in, v. 488, 489
    paraffin injection in, v. 488
    taxis in, v. 487
  umbilical, congenital, v. 485
    ethyl chloride anesthesia in, v. 486
    immediate closure of ring in, v. 485
    laparotomy with extirpation of sac in, v. 485
    moist, warm compresses in, v. 486
    Nota's method in, v. 486
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Hernia (*continued*).
- umbilical, infantile, v. 456, 486
  - **button-mold and plaster in**, v. 457
  - **Mitchell's technique in**, v. 487
  - **radical operation in**, v. 457, 487
  - **reduction and retention in**, v. 486
- vaginal, v. 496; viii. 771, 773; see also Vagina, Hernia of, this Index.
- ventral, v. 489

In a clinical and experimental study of postoperative ventral hernia, Willard Bartlett (N. Y. Med. Jour., Jan. 22, 1916) found it to depend on 2 factors, a weak wall and a hernial tendency. The varieties of operation are overlapping, reconstruction, flap inversion, filigree, and free transplantation. In a series of 78 operations, 7 results were not known, 2 treated with filigree were failures, 4 recurred after the overlapping method, and all the others were complete cures.

E. M. Stanton (N. Y. State Jour. of Med., Oct., 1916), after 500 personal laparotomies, noted 24 hernias, all ascribed to weak union of the fascial layers anterior and posterior to the rectus muscles. Below and above the fold of Douglas the transversalis fascia and peritoneum together form the first line of defense. If the fascia is not properly united, the overlying muscle yields, leaving only, as defense, the fascia of the anterior sheath.

Usually the posterior sheath is included in the suture closing the peritoneum, but often it is missed. Between it and the peritoneum is often a half-inch or more of fat. In such cases it is often better to use a second continuous suture for this fascia. Of 260 rectus and midline incisions in clean cases only 3 hernias followed, whereas of 186 rectus and midline incisions for acute intra-abdominal infections, and subacute and chronic conditions requiring drainage, 18 resulted in hernias. A drain up to 3 cms. in diameter at one angle of the wound does not materially increase the danger of hernia. Only 3 hernias could be traced to the site of drainage. In no case was there paralysis of the rectus due to interference with nerve supply. The McBurney incision seems oftener followed by hernia than any other.

- **bandage in**, v. 489
  - **Lennander's technique in**, v. 489
  - **Mayo's technique in**, v. 490
  - **periosteal flap in**, v. 490
  - **reduction of patient's weight in**, v. 490
  - **removal of fat nodule in**, v. 490
  - **silver filigree in**, viii. 137

Hernial aneurism, i. 664

Herniotomy, **beta-eucaine infiltration anesthesia in**, iv. 702
- **cocaine anesthesia in**, iii. 469, 484, 495; v. 477, 478, 499
- **ether anesthesia in**, iv. 642, 689
- **infiltration anesthesia in**, iii. 497, 499
- **intravenous ether anesthesia in**, iv. 689

Heroin, vii. 172, 176, 181
- habit, see Morphinomania, vii. 191, also this Index.

Herpes (herpes febrilis), v. 510

In recurrent herpes in children, H. G. Adamson (Brit. Jour. of Child. Dis., July, 1916) advises that any source of reflex irritation, such as adenoids, dental trouble, defective eyesight, and intestinal worms, be remedied. Two to 5 grains (0.12 to 0.3 Gm.) of **quinine** at the beginning of an attack may abort it, as also **collodin** locally before the vesicles have matured, or **calamine lotion** if already formed.

- facialis, v. 512
  - **acetanilide in**, i. 227
  - **acetic acid in**, v. 515
  - **alcohol in**, i. 533
  - **alcohol forbidden in**, v. 515
  - **alkalies in**, v. 516
  - **althea in**, v. 515
  - **ammonia water in**, v. 515
  - **arsenic in**, v. 515
  - **boric acid in**, v. 515
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  - **cherry-laurel water in**, v. 516
  - **cocaine in**, v. 516
  - **codliver oil in**, v. 516
  - **colchicum in**, v. 516
  - **cold sponging in**, v. 515
  - **collodion (flexible) in**, v. 515
  - **diet in**, v. 515

Herpes facialis (*continued*).
  frictions in, v. 515
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  hamamelis in, v. 161
  ichthyol in, v. 515
  Lassar's paste in, v. 515
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  sodium borate in, v. 516
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  Vidal's lotion in, v. 516
  zinc carbonate in, viii. 837
  zinc oxide in, v. 515; viii. 837
  zinc stearate in, v. 515; viii. 837
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  saline enemata in, v. 519
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  starch bath in, v. 519
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  zinc oxide in, v. 519
  zinc sulphate in, v. 518
Herpes gestationis, v. 516
  blood-serum from pregnant women in, v. 517
  calcium lactate in, ii. 718
simplex, v. 510

In a case of recurrent generalized herpes simplex, Frank Cohen (Jour. Amer. Med. Assoc., May 20, 1916) isolated a causative streptococcus, and cured the condition with an autogenous vaccine.

tonsurans, potassium sozoiodolate in, vii. 585
  maculosus, see Pityriasis Rosea, vii. 478
zoster (shingles, zona), v. 498

Green-producing streptococci apparently having a strong affinity for ganglia and posterior nerve roots were cultivated by Rosenow and Oftedal (Jour. of Infect. Dis., May, 1916) from the tonsil or pyorrheal pockets in most cases of human herpes of every variety studied. Intravenous injection of this material and of the cultured organisms in no case failed to produce experimental herpes on the skin, tongue, or lips of rabbits and other animals. In some animals with skin herpes there were also herpetiform lesions of the viscera, and in these the vagus or sympathetic ganglia were found hemorrhagic. Herpetic pain, acute or chronic, is due to active infection of the ganglia and posterior roots. Herpes zoster accompanied by empyema or peptic ulcer is not reflex, but an actual systemic infection. The atrium of infection (tonsils or gums) is the site where the streptococcus acquires selective activity on ganglia and posterior nerve roots.

In treating herpes zoster, L. H. Adler, Jr. (Penna. Med. Jour., Aug., 1916), gives Fowler's solution, 6 minims (0.36 c.c.) 4 times daily. The parts are cleansed with 2 per cent. creolin solution, and freely dusted with borated talcum powder. Over this absorbent cotton is applied.

  acetanilide in, i. 226
  aconite in, i. 285
  alcohol in, i. 533

Herpes zoster (*continued*).
  Anderson's dusting-powder in, v. 509
  antipyrin in, ii. 42; v. 508
  arsenic in, v. 508
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  constant current in, v. 509
  creta preparata in, v. 508
  diet in, v. 507
  dusting-powders in, v. 509
  freedom from worry in, v. 507
  guaiacol in, v. 148
  iodoform in, v. 508
  iron in, v. 508
  Lassar's paste in, v. 509
  lead water in, v. 509
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  nux vomica in, v. 508
  opium in, v. 509
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In using hexamethylenamine, J. W. T. Walker (Med. Press and Circ., ci, 304, 1916) has tabloids made up coated with keratin, in which form the drug does not split in the stomach and cause gastric symptoms. The urine must be kept in an acid state with either acid sodium phosphate or ammonium benzoate. In acute colon bacillus infection he recommends alkaline treatment of the urinary tract before resorting to hexamethylenamine, which should then be given to the limit of tolerance, whether the kidney or the bladder is involved.

O. Leyton (Lancet, July 22, 1916) found granular casts, red cells, and massive albumin in a patient free of renal or cardiac disease, who had been taking large amounts of hexamethylenamine for colon bacilluria. It was thought the formaldehyde might have permanently damaged the kidneys. Nine years later, however, the condition was about as before, and his health apparently still normal.

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According to Branth (N. Y. Med. Jour., Dec. 30, 1916), many cases of *mastoiditis* can be aborted if all pus in the auditory cavity has been evacuated by applying the high frequency current, the ears being filled with cotton soaked in salt solution to form a good conduction. Many *gall-bladder infections* without gall-stones can be helped by the current. In *gonorrhea* the part should be immersed in a cup filled with salt solution, to distribute the current evenly. In old cases of *gout* the current should be applied with large or multiple electrodes.

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  contusion of.

In true hip contusion Grégoire (Paris méd., June 17, 1916) points out that pain and disability may persist for a long period, then suddenly disappear. Again, 3 cases of so-called hip contusion proved actually to be impacted intracapsular fractures, and would have remained improperly diagnosed without X-ray examination. The complete functional disability held characteristic of fracture is not a constant sign, motion, and even walking, being sometimes possible for a period after fracture of the neck. He warns against diagnosticating hip contusion without careful X-ray examination.

disease, vi. 151

H. L. Taylor and George Barrie (Trans. Amer. Med. Assoc.; N. Y. Med. Jour., June 30, 1917) point out that many cases previously classed as hip tuberculosis are due to a focal infection or pathological process in the neck, head, or trochanter, mainly areas of hemorrhagic osteomyelitis (Barrie), pus foci, or residual foci from an old osteomyelitis. There is often a persistent limp, with mild hip symptoms. Some of these bone spots heal spontaneously, others require fixation or curettage, with or without introduction of bone chips. In case of bone abscess, with more violent symptoms, the small cavity should be freely opened, curetted and sterilized.

Certain abscesses and fistulas above and near the hip joint which returned repeatedly after curettage and apparent healing, were found by T. Rovsing (Hospitalstidende, Mar. 29, 1916) to be merely the lower part of an hour-glass abscess, the upper, primary process being in the inner surface of the sacrum. The pus flows along the pyriformis muscle, emerges through the greater foramen, and collects below, being usually mistaken for a primary process in the trochanter or hip joint or for bursitis. It is cured by curetting and providing ample drainage, after incising on the median line and resecting the coccyx.

Savariaud (Jour. de méd. de Paris, Jan., 1917) asserts that any inflammation capable of exciting the iliopsoas muscle to contracture, *e.g.*, an adenitis of the iliac fossa, may suggest coxalgia. The latter is excluded if abduction is free, if pressure exerted posteriorly at the level of the femoral head causes no pain, if there are no nocturnal pains; and if claudication is lessened, the more the patient walks.

Under the designation "quiet hip disease," Taylor and Frieder (Surg., Gynec. and Obstet., Feb., 1916) refer to a hip affection neither tuberculous nor syphilitic, known in Europe as osteochondritis of the hip, or Perthes' disease, of which they have studied 19 cases. Slight lameness, often painless, is the chief symptom. Pain, when present, is mild. General health is not impaired. After some months there may be a shortening of ¼ to ½ inch. Later, rotation and lateral motion are limited. The X-rays show the head flattened and the epiphysis thin, irregular, and pressed out toward the trochanter. Simple treatment suffices, though recovery of the joint may not be perfect.

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If joint infection in wounds of the hip or knee is slight, Prat (Bull. et mém. Soc. de chir. de Paris, xlii, 1777, 1916) drains the joint at the lowest point after arthrotomy and ether lavage. If more serious, and return of movement cannot be hoped for, he makes a large arthrotomy, often with a synovectomy. If this is insufficient and there is much bone débris, resection is called for. In 7 hip cases recovery was obtained twice by simple plaster immobilization with continuous extension, and in 1 case by curet-

tage of the head of the femur; in the 4 other cases, resection gave 3 recoveries and 1 death.

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In incipient hip joint disease Speer (Amer. Jour. of Surg., Sept., 1916) used by night an ordinary knee extension apparatus, with a split boot of plaster or other material. This relieves the child from pain and night cries. For the day he uses a well-fitting pair of shoes. On the bottom of that for the well foot is a cork extension 1 to 3 inches thick, while on the opposite shoe there is a heel of lead, as heavy as the patient can comfortably carry. In locomotion with crutches, the muscles contracting to steady the heavy weight immobilize the hip even better than the Thomas splint.

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Early diagnosis of Hodgkin's disease is urged by Yates and Bunting (Jour. Amer. Med. Assoc., Mar. 10, 1917). Portals of entry of infection should be sought and eliminated, as by tonsillectomy, healing of chronic cutaneous or mucous membrane lesions, care of the teeth and accessory sinuses, and cure of enterocolitis or constipation. Early extirpation of all accessible enlarged glands should also be practised, followed at once by prolonged Roentgen-ray treatment of the operative field and of all glands not removed. All efforts should be made to improve general health. Immune serum should be given for its general and specific effects. Medication may be helpful as a general measure. Excision for diagnosis should never be tried unless one is prepared to make it complete if a frozen section proves positive, as this procedure accelerates the disease. Upon the treatment mentioned, recovery for over 5 years is estimated to occur in less than 5 per cent. of acute cases; 80 to 90 per cent. of incipient chronic cases; 60 to 70 per cent. of early chronic, and 5 to 10 per cent. of advanced and rebellious chronic cases.

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A. F. Holding and S. Brown (Jour. Amer. Med. Assoc., Mar. 3, 1917) state that the **X-ray** treatment should be started with maximal doses of rays from a Coolidge tube, and continued with smaller doses at short intervals. No arsenic should be given during X-ray treatment. Intestinal stasis should be overcome by **bland enemas** twice weekly, and **sulphur** orally, continued until hydrogen sulphide no longer occurs in the stools.

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Billings and Hickey (Jour. Amer. Med. Assoc., Dec. 23, 1916) noted that among 300 cases treated with **thymol**, 74 per cent. were cured with 1 course, 15 per cent. required 2, and nearly 1 per cent. needed as many as 6 courses. With **oil of chenopodium** none required more than 2 courses, and 87 per cent. were cured with a single course. Saturated solution of **magnesium sulphate**, 60 c.c. (2 ounces), was given at 7 A.M., and a saturated solution of **sodium sulphate**, 90 c.c. (3 ounces), at 7 P.M. Next morning at 7 o'clock 15 drops of oil of chenopodium were given on sugar, and the dose repeated at 9 and 11 A.M. At 1 P.M. 18 c.c. (4½ drams) of **castor oil** with 2 c.c. (½ dram) of **chloroform** were given, followed in ½ hour by 30 c.c. (1 ounce) of plain castor oil. A cup of tea was allowed at 2 P.M. No toxic effects of chenopodium were observed.

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Washburn (Jour. Amer. Med. Assoc., Apr. 21, 1917) has found that a mixture of equal parts of finely powdered **thymol** and **sodium bicarbonate** gave better curative results and caused less gastric irritation than thymol alone.

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In an analysis of 500 cases, Findley (Amer. Jour. of Obstet., June, 1917) found that the birth of moles occurs with about equal frequency in the second and third trimesters of pregnancy. Chorioepithelioma malignum developed in 157 cases, or 31.4 per cent. In the 265 benign moles there was a mortality of 10.5 per cent. Bleeding occurred in 66 per cent.; pain in 9.5 per cent.; albuminuria in 3.8 per cent.; and vomiting in 13.5 per cent. Among the malignant cases there were vaginal metastases in 25; pulmonary in 21, and cerebral in 4. In 386 cases there was spontaneous delivery in 43.2 per cent.

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The frequency of hydrocele in infants with inherited syphilis is emphasized by Vaglio (Pediatria, Apr., 1917). Often it seems to be the only manifestation. It causes no disturbance, and usually subsides of itself.

Attention is called by J. P. Tourneux (Prog. méd., Feb. 20, 1916) to the advantages of a method for the radical cure of hydrocele, first suggested by Gomoiu and Phocas. An inguinal or inguinopubic incision 2 to 4 cm. long is made. By pressure from the scrotum, the tunica vaginalis appears between the lips of the wound. Two forceps being placed on its wall, the contents of the vaginal sac are evacuated through an incision. The testicle and its envelopes are then drawn through the wound and dealt with according to the state of the serosa, which may necessitate a partial resection of the parietal fold. The reaction inside the scrotum is much less than after a scrotal incision; the patient is kept in bed but a few days.

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That certain types of hydrocephalus (choroidorrhea) may be of toxic origin is deemed probable by C. M. Remsen (Interstate Med. Jour., xxii. 89, 1916), since brain, plexus, or pituitary extracts, and also muscarine. have a stimulating, thyroid a depressing, effect upon the choroid secretion. Von Bramann's **ventriculostomy** is recommended both in hydrocephalus of obstructive type and in essential choroidorrhea in infancy, before cerebral destruction has occurred.

Four types of hydrocephalus are recognized by C. H. Frazier (Amer. Jour. of Dis. of Child., Feb., 1916): (1) *Hydrocephalus obstructivus.* This, the old "internal" variety, is due to blocking of 1 of the outlets for cerebrospinal fluid through a congenital defect or by inflammation. It must be differentiated from the other varieties, as the treatment differs. (2) *Hydrocephalus non-absorptus.* Absorption of fluid is defective as proved by the phenolsulphonephthalein test. (3)

Hydrocephalus hypersecretivus. Probably due to disease of the choroid plexus. (4) *Hydrocephalus occultus.* Occurs usually in children, is characterized by excess of fluid, without enlargement of the skull, and symptomatically resembles a brain tumor. Such a case was operated upon and relieved.

In determining the variety, phenolsulphonephthalein is injected into the lumbar subarachnoid space, and the urine tested. Next day the drug is injected into the lateral ventricle, and its excretion into the spinal canal tested by lumbar puncture. With these tests one localizes an obstruction if there is one.

In the obstruction type, **puncture of the corpus callosum** is advocated; in the non-absorptive type, **drainage** into the pleural cavity. In a case due to hypersecretion, **thyroid feeding** proved very successful.

In operating for hydrocephalus, Sharpe (Amer. Jour. Med. Sci., Apr., 1917) inserts 6 linen strands into the ventricles in the internal type, and merely into the subarachnoid and subdural spaces in the external type of hydrocephalus, and brings their ends through the temporal muscle and fascia beneath the scalp in a stellate manner. Of 41 cases, 13 could not survive the sudden loss of cerebrospinal fluid. Later this difficulty was overcome by elevating the head. In the other 28, results were very encouraging, all but 6 showing propressive improvement.

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   camphorated oil in, v. 553
   cleansing of teeth in, v. 554
   digitalis in, v. 553
   eggs in, v. 553
   evacuation in, v. 554
   gum arabic in, v. 553
   hot saline in, v. 554
   hot water in, v. 554
   ice in, v. 553
   intravenous injection of ammonia in, v. 553
   jejunal feeding in, v. 555
   lavage of stomach in, v. 553, 554
   lime in, v. 553
   Loreta's operation in, v. 554
   magnesia in, v. 553
   milk in, v. 553
   morphine in, v. 553
   mucilage in, v. 553
   nutrient enemata in, v. 553
   oils in, v. 553
   prepared chalk in, v. 553
   soapsuds in, v. 553
   sodium bicarbonate in, v. 553
   stimulant enemata in, v. 553
   strychnine in, v. 553
   surgical measures, v. 554
   wall scrapings in, v. 553
Hydrocyanic acid, v. 557
  poisoning by, v. 560
   alternate hot and cold affusions in, v. 563
   ammonia in, v. 563
   artificial respiration in, v. 563
   atropine in, v. 563
   brandy in, v. 563
   caffeine in, v. 563

Hydrocyanic acid, poisoning by (*continued*).
  cobalt nitrate in, v. 562
  coffee infusion in, iii. 516
  epinephrin in, v. 563
  ether in, v. 563
  heat (external) in, v. 563
  hydrogen dioxide in, v. 562
  iron subsulphate in, v. 562
  lavage of stomach in, v. 562, 563
  magnesia in, v. 562
  Martin and O'Brien's antidote in, v. 562, 563
  mustard in, v. 562
  potassium carbonate in, v. 562
  saline purge in, v. 563
  sodium thiosulphate in, v. 562
  stimulation in, v. 562
  sulphuric acid in, v. 563
  tickling the fauces in, v. 562
  vinegar in, v. 562
Hydrogen chloride, see Hydrochloric Acid, v. 548
 cyanide, see Hydrocyanic Acid, v. 557
 peroxide, see Hydrogen Dioxide, v. 565
 sulphide poisoning, oxygen inhalations in, vii. 274
Hydronephrosis, vi. 197, 218

In experiments, Barney (Annals of Surg., May, 1917) found that sudden, complete obstruction of 1 ureter produces hydronephrosis in most cases, though rarely an atrophy of the kidney develops. When hydronephrosis occurs, the venous collaterals are well developed; atrophy is due to lack of development of these. When obstruction to the ureter is partial or intermittent the hydronephrosis is of greater size than when it is complete and permanent, for in the latter case urinary secretion ceases before the venous collateral circulation has time to develop.

Discussing the radiographic diagnosis of hydronephrosis M. Krotoszyner (Calif. State Jour. of Med., xv, 58, 1917) notes that the normal kidney shows dim shadows of the 2 main calyces, and of the small, slit-shaped pelvis. Sharp beginning pelvic shadows are significant of beginning hydronephrosis. Of still greater importance is the ureteropelvic junction, which in beginning hydronephrosis becomes angular in contour, while the pelvis becomes sacculated. Dilatation of the renal pelvis and of the calyces may be found independently or simultaneously. In sacculation of the whole kidney the shadows of the calyces exceed in size that of the pelvis.

  removal of obstruction in, vi. 200
 ureteral catheterization in, viii. 678
 acquired, vi. 203
  aspiration in, vi. 203, 220
  drainage in, vi. 198, 203
  incision in, vi. 198
  massage over sac in, vi. 203
  nephrectomy in, vi. 203, 221
  nephorrhaphy in, vi. 203
  nephrotomy in, vi. 203, 218
  plastic operation in, vi. 221
 congenital, vi. 197, 201, 203
 intermittent form (Landau), vi. 197, 199
  early removal of obstruction in, vi. 200
 paraplegica, vi. 197
Hydropericardium, v. 288
Hydrophobia, see Rabies, vii. 722; also this Index.
Hydrophthalmos, v. 27
  iridectomy in, v. 27
Hydropneumothorax, see Pleura, Diseases of: Pneumothorax, vii. 516
Hydrorrhea, nasal, see Hyperesthetic Rhinitis, v. 600; also this Index.
Hydrosalpinx, vii. 242

Studying 100 cases, Jagerroos (Finska Lakare. Hand., Sept., 1916) found that among 70 women 45 had been entirely cured after salpingotomy. In 8 the hydrosalpinx returned on the other side. In 14 cases treated by salpingostomy the results were satisfactory, though in 5 cases some subjective disturbance remained.

Hydrotherapy, see Water, viii. 808
Hydrothorax, vii. 523
  aspiration in, iii. 159; vii. 524
  digitalis in, vii. 524
  jalap powder in, viii. 97
  pilocarpine in, vii. 469
  scoparius in, viii. 97
  venesection in, vii. 524
Hygroma, viii. 544
Hymen, imperforate.

A case reported by Wiener (Amer. Jour. of Obstet., lxxv, 398, 1917) was that of a girl of 12, complaining of

difficult micturition and enlargement of the abdomen. The hymen was found imperforate and bulging, and there was a fluctuating mass reaching up to the umbilicus. The preoperative diagnosis was hematocolpos, but on excising the hymen about 30 ounces of thin, yellowish-white fluid was evacuated from the enormously dilated vagina, apparently derived from the glands of the endometrium and cervix.

- Hymenolepsis diminuta, vii. 325
  - nana, see Tenia Nana, vii. 324
- Hyoid bone, fracture of, iv. 763
- Hyoscine, see Scopola and scopolamine, viii. 98
  - hydrobromide in cocaine anesthesia, iii. 484
- Hyoscyamus, v. 575
  - poisoning by, v. 578
    - caffeine sodiobenzoate in, v. 578
    - coffee (hot) by rectum in, v. 578
    - emetic and warm water in, v. 578
    - ice-bag to head in, v. 578
    - Lugol's solution in, v. 578
    - morphine in, v. 578
    - physostigmine (eserine) in, v. 578
    - pilocarpine in, v. 578
    - potassium permanganate in, v. 578
    - stomach-tube in, v. 578
    - strychnine in, v. 578
    - tannic acid in, v. 578
- Hyperacidity, gastric, see Stomach, Hyperacidity of, viii. 330; also this Index.
- Hyperadrenalism, obesity of, vii. 154
- Hyperadrenia, acute, or acute hyperadrenalism, i. 444; see also Adrenals, Diseases of, this Index.
- Hyperchlorhydria, see Stomach, Hyperacidity of, viii. 330; also this Index.
- Hyperchylia, see Heterochylia, viii. 335
- Hyperemesis gravidarum, see Pregnancy, Vomiting of, vii. 598; also this Index.
- Hyperemia, Bier's treatment by, v. 580
  - of conjunctiva, see Conjunctiva, Hyperemia of, iii. 551; also this Index.
  - of nerves, vi. 788
  - of spleen, acute, viii. 301
- Hyperesthesia, gastric, see Stomach, viii. 336; also this Index.
  - general, warm baths in, viii. 812
  - pharyngeal, vii. 434
- Hyperesthetic rhinitis, v. 600

According to Flood and Coca (Jour. of Immunology, Feb., 1917) hay fever is an expression of local hypersensitiveness, established spontaneously and never by immunologic process. The active pollen substances are not toxins. The antibody-like substances of human sensitization are not demonstrable in the blood of sensitive persons by any of the immunity reactions. They are present in the cells of the sensitive tissues. They cannot be increased artificially by the usual process of immunization. The mechanism of relief from vaccine therapy is like that of desensitization in experimental anaphylaxis. The freedom from symptoms lasts as long as the respective antigenic substances remain in combination with the antibody-like substances in the tissues.

- acetanilide in, v. 606
- acetic acid in, i. 230; v. 604
- acetphenetidin in, v. 606
- adrenalin in, v. 604, 605, 606, 609
- alcohol, intraneural injection in, v. 609, 610
- antipyrin in, ii. 44; v. 606
- atropine in, ii. 446; v. 606
- bacterial vaccines in, ii. 405; v. 607

G. B. Webb (Boston Med. and Surg., Jour., Jan. 6, 1916) at times administered the catarrhal organism (vaccine) combined with the pollen vaccine. In ½ the cases success was obtained.

According to O. Berghausen (Lancet-Clinic, Apr. 1, 1916), when mucous membranes have become irritated, micro-organismal activity complicates the clinical picture of hay fever. Autogenous vaccines should then be used, often yielding as much improvement as pollen extracts.

- cannabis indica in, iii. 6
- cauterization of hyperesthetic area in, v. 604
- cherry-laurel water in, v. 606
- chromic acid in, v. 604
- climatic treatment in, v. 607, 608
- cocaine in, iii. 482; v. 604
- codeine in, v. 606
- cold compresses in, v. 605
- cubeb in, iii. 711

Hyperesthetic rhinitis (*continued*).
- **eserine** in, v. 606
- **excision of tubercle of nasal septum** in, v. 610
- **galvanocautery** in, v. 604

According to P. Bonnier (Bull. de l'Acad. de méd., June 27, 1916), hay fever is a neurotic disorder readily curable by making a forcible impression on the centers. In testing the sensitiveness of the anterior nasal mucosa with the tip of a fine **galvanocautery**, without local anesthesia, a point is found at which the least contract will cause flinching, conjunctival congestion, and lacrymation. At this point a slight, hardly perceptible cauterization should be carried out. After a perfunctory paroxysm the patient is, in 25 per cent. of cases, at once freed from his ailment. In the remainder, several treatments are required.

- **glasses (blue or smoked)** in, v. 605
- **grindelia** in, v. 142, 606
- **heroin** in, v. 606
- **intraneural injections** in, v. 608, 609
- **iodine inhalations** in, vi. 39
- **lobelia** in, v. 606
- **menthol** in, v. 605; vi. 650
- **mentholated chloroform** in, v. 605
- **morphine** in, v. 606
- **nerve section** in, v. 608, 609
- **novocaine** in, v. 609
- **orthoform** in, v. 605
- **paregoric** in, v. 606
- **pilocarpine** in, v. 606

Six hay fever patients were treated by Zueblin (Med. Record, July 7, 1917) with **pituitary** (1 c.c.—16 minims) and **adrenalin** (0.5 c.c.—8 minims) injections. All had cardiac dilatation with digestive disorders and indicanuria. All showed reduction in the size of the heart, and the hay fever attacks did not return, or were lessened in intensity. Cardiac disturbances, with lack of vasomotor tonus and low circulation, may favor the manifestations of pollen irritation.

- **pollantin (Dunbar's)** in, v. 607
- **poppy syrup** in, v. 606
- **potassium bromide** in, v. 606
- **potassium iodide** in, v. 606

Hyperesthetic rhinitis (*continued*).
- **quinine** in, iii. 384; v. 605
- **removal of growths or spurs** in, v. 604, 608
- **senega** in, v. 606
- **serum (Dunbar's)** in, v. 607
- **sodium bicarbonate** in, viii. 191

Kellogg (N. Y. Med. Jour., Aug. 21, 1915) gave **sodium bicarbonate** in dram (4 Gm.) doses 3 times a day to 50 hay fever patients. Ninety per cent. were markedly benefited, 70 per cent. obtaining complete relief after a few days' treatment. In 3 cases a nasal spray of sodium bicarbonate solution was superadded.

- **strychnine** in, v. 608
- **sulphurous acid** in, viii. 433
- **suprarenal gland** in, v. 604, 605, 607
- **surgical measures** in, v. 608
- **thyroid gland** in, i. 748; v. 608
- **trichloracetic acid**, v. 605
- **vaccines** in, v. 607, 608

With regard to the pollen vaccine treatment, Hitchens and Brown (Jour. of Lab. and Clin. Med., Apr., 1916) advise that when the patient can be studied before the hay fever season, a survey of his habitual surroundings and skin tests should be made with pollens that might be connected with the anaphylactic phenomena. If the attack has already started, a vaccine of the pollens most likely responsible should be begun at once. They report 63 cases treated with **pollen vaccines.** Of 18 complicated with asthma, 11 were entirely relieved. Of the remaining 44, 17 were entirely relieved, 18 considerably relieved, 4 slightly relieved, 2 not relieved, and 3 not reported. The vaccines used were, in the spring, a mixture of pollens from red-top timothy, rye, and orchard grass, and, in the fall, ragweed alone. The possibility of a concurrent bacterial infection should always be taken into account.

Howe (L. I. Med. Jour., May, 1916) notes that more or less successful results are being attained regardless of how the pollen toxin is prepared. He noticed that at one time several cases which had been rendered entirely immune by pollen toxin reported active symptoms. Testing the toxin, he found it had deteriorated. He believes pollen toxin deteriorates so rapidly that it is absolutely useless within 48 hours after the change begins, and advises the use of fresh toxin every 8 to 12 days.

Wilson (Laryngoscope, xxvi, 937, 1916), reporting 26 cases treated by injection of **pollen extracts** and 22 by **calcium chloride,** asserts that the specific pollen solutions will materially relieve a small percentage of the cases if treatment is begun early enough. Treatment by calcium salts is largely empirical, but from data at hand, if the doses are large enough and persistently given, a large percentage of patients will receive benefit.

   valerates in, v. 606
   valerian extract in, v. 606
   Wright's pollen vaccine in, v. 608
  pseudoform of, v. 603
Hyperidrosis, viii. 445
  agaricin in, i. 482; viii. 445
  alcohol in, i. 534
  alum in, i. 584; viii. 445
  aluminum carbonate in, i. 590

In localized hyperidrosis, A. W. Stillians (Jour. Amer. Med. Assoc., Dec. 30, 1916) recommends **aluminum chloride** in 25 per cent. solution, mopped on every second or third day for 3 applications. The skin should be allowed to dry thoroughly. Later, 1 application may be made weekly to prevent recurrence. If itching follows, **cold cream** containing 12 per cent. of **boric acid,** or a **calamine lotion,** with or without 0.5 per cent. of **phenol,** may be used.

  aristol in, ii. 118
  atropine in, viii. 445
  belladonna in, ii. 451
  betanaphthol in, viii. 445
  bismuth subnitrate in, viii. 445, 446
  bromides in, viii. 445
  calcium phosphate in, viii. 445
  camphor, spirit of, in, viii. 445
  chloral hydrate in, iii. 211
  chromium trioxide in, iii. 337
  ergotin in, viii. 445
Hyperidrosis (*continued*).
  formaldehyde in, iv. 736; viii. 445
  glycerin in, v. 31
  naphthalene in, vi. 786
  phosphorus in, vii. 456
  picrotoxin in, vii. 463
  pilocarpine in, vii. 471; viii. 445
  pomegranate in, vii. 331
  potassium permanganate in, viii. 445
  salicylic acid in, viii. 59, 445
  sodium salicylate in, viii. 446
  starch in, viii. 445
  static baths in, viii. 445
  sulphur in, viii. 445
  talcum in, viii. 445
  tannin in, viii. 445, 498
  thymol in, viii. 445
  valerates in, viii. 445
  vinegar in, viii. 445
  walnut-leaves infusion in, viii. 445
  warm and cold douches in, viii. 445
  X-rays in, viii. 446, 828
  of the axillæ, **sodium carbonate** in, viii. 189
  of the feet, **sodium carbonate** in, viii. 189
Hyperkeratosis of the pharynx, see Pharynx, Hyperkeratosis of, vii. 426
Hypermetropia.

Much evidence has been collected by M. Straub (Nederl. Tijdsch. v. Geneeskunde, Feb. 26, 1916) to the effect that hyperopia is exclusively of psychic and not of mechanical nature. Nearly all children are born hypermetropic, but become emmetropic during the third year. Hypermetropia likewise becomes, in all likelihood, established during this year, as the child then determines its mode of fixation.

Hypermotility, nervous, viii. 353
Hypernephroma, i. 471; ii. 763; vi. 216; see also Adrenals, Diseases of, this Index.
Hyperosmia, vii. 101
Hyperphoria, see Strabismus, viii. 401
Hyperplastic rhinitis, see Rhinitis, Hyperplastic, vii. 76
Hyperpyrexia, **acetanilide** in, i. 225
  acetphenetidin in, i. 250
  antipyrin in, ii. 41
  cinchona in, iii. 382
  cold in, iii. 531
  quinine in, iii. 382, 386

Hypersecretion of the stomach, **aluminum silicate** in, i. 590
Hypertension, vascular, ii. 492; see also Blood-pressure, this Index.
Hyperthyroidia or hyperthyroidism, i. 715
  arsenic in, i. 717
  hygienic measures in, i. 717
  thyroid gland in, i. 715
Hypertonia, muscular, iii. 636
Hypertonic sodium chloride solution, see Saline Solution, viii. 194
Hypertrichosis, v. 152

Of 281 cases of trauma of the extremities seen by Lebar (Paris méd., Jan. 29, 1916), 44 showed distinct localized hypertrichosis. In 34 of these, injury to 1 or more nerves was found. Two more had neuropathic paralysis. In a case of slight injury to the ulnar nerve, the hand and forearm up to the deltoid muscle showed a heavy growth. The area of hypertrichosis never corresponded to that of distribution of the injured nerve. It is ascribed partly to immobilization, upsetting the reflex trophic impulses from the spinal centers, and partly to injury to sympathetic nerve fibers accompanying nerves or vessels.

According to G. R. McAuliff (Jour. Amer. Med. Assoc., Jan., 1916), hypertrichosis is based on a disturbance of the ductless glands. The suprarenals seem chiefly concerned with sexual characteristics, and next the pineal, hypophysis, ovaries, thymus, and thyroid. Apparently disturbance of a single gland seldom causes marked hypertrichosis. There must exist some complex disturbance of pluriglandular equilibrium.

M. L. Heidingsfeld (Lancet-Clinic, Sept. 23, 1916) reports a case of marked hypertrichosis in which the hair was completely removed by an application of **radium.** The measure is painless and rapid, and the cosmetic result far better than with the galvanic needle.

  X-ray in, viii. 828
Hypertrophic emphysema, see Emphysema, Pulmonary, iv. 453; also this Index.
Hypertrophic nasal catarrh, see Rhinitis, Hyperplastic, vii. 76
  ozena, see Rhinitis, Hyperplastic, vii. 76
  rhinitis, see Rhinitis, Hyperplastic, vii. 76; also this Index.
Hypertrophied scars, see Scars, Hypertrophied, viii. 168; also this Index.
Hypertrophy of middle turbinate, erectile tissues, **nitric acid** in, vii. 46
  of the heart, see Heart, Hypertrophy of, v. 251; also this Index.
  of the lip, viii. 437
  of nails, vi. 780
  of the penis, vii. 335
  of the prostate, viii. 709; also this Index.
  of pylorus, viii. 395
  of the testicles, vii. 347
  of the turbinated bones, see Rhinitis, Hyperplastic, vii. 76
  of the vagina, viii. 770
  of the vulva, viii. 770
Hypnotism, see Suggestive Therapy, viii. 418
Hypoadrenia, functional, i. 456
  progressive, i. 466
  terminal, i. 436
  see also Adrenals, Diseases of, this Index.

Having removed ½ to 7/10 of the suprarenal tissue from dogs, Hoskins (Amer. Jour. of Physiol., Mar., 1915) observed, 1 to 8 days after the operation, that the blood-pressure and vasomotor reaction to **nicotine** was decreased.

Hypochlorhydria, **koumiss** in, vi. 237
  silver nitrate in, viii. 135
  strontium lactate in, viii. 409
Hypochondriasis, **anhalonium** in, i. 700
  cactus grandiflorus in, ii. 708
  climatic treatment in, vi. 716
  colocynth in, iii. 538; viii. 75
  gold in, v. 74
  head douches in, viii. 811
  hypnotherapy in, viii. 421
  iron waters in, vi. 712
Hypochylia, see Heterochylia, viii. 335
Hypodermoclysis, v. 683; viii. 197
Hypogastric fistula, viii. 736
Hypoglossal nerve, neuritis of, vi. 803
Hypophosphites, see Phosphorus, vii. 450
  compound syrup of, ii. 712; vii. 134, 449
  emulsion of codliver oil with, ii. 712
Hypophyseal syndrome, i. 292; see also Pituitary Body, this Index.

Hypophysis, tumors of the, i. 292; see also Pituitary Body, this Index.
  hexamethylenamine in, v. 530, 531
Hypopituitarism, see Hypophyseal Syndrome, i. 292; see also Pituitary Body, this Index.
Hypopyon, vi. 67

F. H. Verhoeff (N. Y. Med. Jour., June 16, 1917) makes an **incision** with a Beer knife with its back to the cornea through the ulcer, but not through Descemet's membrane. Radial incisions are next made from the first. The infiltrated margin is then superficially **curetted**, the entire cornea dried with cotton, a concentrated **Lugol solution** applied to the ulcer until every part has been touched, and a drop placed on its floor and allowed to remain 5 minutes, after which it is quickly flushed out by a jet of **boric acid solution.** In 48 hours improvement is marked. The method will check the progress of small or medium sized ulcers.

Hypospadias, viii. 680

Two cases operated on successfully by the method of Streissler and Lexer, by **transplantation of the vermiform appendix** to reconstruct the urethra, are reported by H. Weitz (Deut. med. Woch., xli, 1064, 1915). The appendix, drawn through the glans, is first sutured at one end to the skin back and to one side of the urethral orifice. After 4 weeks it is united to the urethra, after formation of a perineal fistula. Both the muscular and mucous coats of the appendix can be used.

Where the urethral orifice is less than 2 inches from the end of the glans, A. D. Bevan (Jour. Amer. Med. Assoc., Apr. 7, 1917) dissects up a large elliptical flap of skin beneath the penis, containing the orifice near its distal end. A hole is punched through the glans, the flap drawn through by its proximal end, and the edges sutured to the margin of the new opening.

  Beck's operation in, viii. 681

A **flap method** with extensive use of the prepuce is recommended by C. Beck (Surg., Gynec. and Obstet., May, 1917), having been used with persistent success in 15 cases.

  flap, from scrotum, in, viii. 680
  Nove-Josserand method in, viii. 680
  Ollier skin-graft in, viii. 680
  plastic operations for, spinal anesthesia in, viii. 211
  Rochet modification in, viii. 680
  straightening in, viii. 680
  Wood's operation in, viii. 681
Hypostatic lung congestion, **strychnine** in, vii. 146
Hypotension, vascular, ii. 496; see also Blood-pressure, this Index.
Hypothyroidia, i. 711; viii. 552

In persons with thyroid insufficiency Petzetakis (Presse méd., Jan. 8, 1917) found the oculocardiac reflex enormously intensified. The sympathetic is left without the normal stimulation from the thyroid, and vagotony results. Under **thyroid** treatment in 1 of his cases, the balance was restored.

Six cases of hemorrhage from the uterus, including 3 of excessive menstruation, due to deficiency of thyroid secretion, are reported by Salzman (Amer. Jour. of Obstet., Nov., 1916). Such hemorrhage can be controlled by dried **thyroid,** 1 to 3 5-grain (0.3 Gm.) tablets a day.

  adrenal gland, desiccated, in, viii. 555
  Blaud's pill in, viii. 555
  glycerin suppositories in, viii. 556
  pituitary extract in, i. 782
  saline purgatives in, viii. 556
  saline solution in, viii. 556
  thyroid gland in, i. 711, 713; viii. 555
  obesity of, vii. 163
  progressive, see Myxedema, viii. 556
Hypothyroidism, see Hypothyroidia, i. 711
Hypotonia, **strychnine** in, vii. 136
Hysterectomy.
  ether anesthesia in, iv. 642
  Schleich's infiltration in, iii. 497
  abdominal supravaginal, viii. 756
  abdominal total, viii. 756
  supravaginal.

A. Reich (Med. Rec., Apr. 22, 1916) reports 2 cases of supravaginal hysterectomy by the vaginal route, and mentions 3 recognized indications for

this operation: (1) Removal of the products of conception during the first 4 months in tuberculosis of the progressive type; (2) in fibroids or general uterine fibrosis where the uterus is too large for the Wertheim-Schauta operation for prolapsus; (3) to check uterine hemorrhage, endangering life, with the least trauma and danger.

vaginal, viii. 756

The indications for vaginal hysterectomy are given by J. C. Taylor (N. Y. Med. Jour., July 8, 1916) as follows: (1) Whenever conservation of the uterus is not to be considered, except where excessively enlarged or adherent; (2) in intraligamentous and retroperitoneal growths; (3) in women past the menopause requiring hysterectomy; (4) in complete uterine prolapse after the menopause; (5) in cancer of the cervix too advanced for a Wertheim operation, yet requiring relief of pain and foul discharge; (6) in cancer of the fundus, still localized; (7) in epithelioma of the cervix in old women with serious heart or kidney trouble. The vaginal route is unsuitable where the appendix or intestines might need attention, or in complete prolapse in young women.

turpentine after, viii. 634
Hysteria, v. 610
amaurosis in, i. 593
amyl nitrite in, vii. 56
amyl valerate in, i. 624
asafetida in, ii. 190
anhalonium Lewinii in, i. 700
blood-pressure in, ii. 499
cactus grandiflorus in, ii. 708
cajuput oil in, ii. 709
camphor in, ii. 732
cephalopin in, i. 794
climatic treatment in, vi. 716
cold douche in, iii. 530
diet in, v. 631, 632
electricity in, v. 631, 632
ether in, iv. 692
exercise (physical) in, v. 631
high-frequency current in, v. 632
humulus in, vi. 467
hypnotherapy in, viii. 421
iron waters in, vi. 712
Hysteria (*continued*).
isolation in, v. 631
lupulin in, vi. 467
massage in, v. 631, 632
menthol in, vi. 649
occupation in, v. 633
oxygen baths in, vii. 275
placebos in, v. 632
psychotherapy in, v. 630; viii. 417
rain douche in, viii. 811
rest treatment in, v. 630, 631
rue in, viii. 44
sinusoidal current in, v. 632
spinal douche in, viii. 811
static current in, v. 632
suggestion in, v. 632
sulphonal in, viii. 426
sumbul in, viii. 433
valerian in, viii. 781
veronal in, viii. 808
of childhood, iii. 638
hypnotism in, iii. 638
water injection in, iii. 638
traumatic, viii. 795
Hysterical amblyopia, i. 598
aphonia, **atropine** in, ii. 446
zinc valerate in, viii. 836
chorea, iii. 331
convulsions, **scopolamine** in, viii. 103
cough, v. 621
gelsemium in, v. 18
manifestations, **apomorphine** in, ii. 68
mutism.

Hysterical mutism, according to Hudson Makuen (N. Y. Med. Jour., May 27, 1916), is usually of sudden onset, and due to some severe psychic or emotional shock. It may occur along with organic nervous diseases, which themselves simulate hysteria, and can be distinguished from them only by actual discovery of the causative pathological conditions. It differs from hysterical aphonia in evincing a more extended disability of the mechanisms of speech, and from aphemia or motor aphasia in that mutism is absolute.

A. J. Hall (Lancet, May 20, 1916) has reported the case of a boy of 11, in whom fear of a tonsil and adenoid operation caused mutism lasting 5 weeks, cured by another fright in the hospital ward after all treatment had failed.

Hysterical spasm, v. 616, 617
    bromides in, ii. 643
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In 2 cases of familial amaurotic idiocy (Tay-Sachs disease) reported by I. A. Shabad (Russky Vratch, xv, No. 33, 1916), the children developed normally until the ages of 6 and 9 months, then became lethargic, idiotic and blind, with muscles so lax that if sat up the face almost touched the knees. Both died at 2 from intercurrent disease.

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Ileosigmoidostomy, intravenous anesthesia in, iv. 688; see also Intestinal Stasis, this Index.

Among 10 cases of intestinal stasis with chronic infectious arthritis operated on by J. T. Bottomley (Jour. Amer. Med. Assoc., Sept. 9, 1916), ileosigmoidostomy was done in 8, the ileum being cut across about 1½ inches above the ileocecal valve. In 1 other case cecosigmoidostomy was done, and in another a hemicolectomy. There was no mortality. The immediate effect was always beneficial, but a relapse followed sooner or later.

Ileostomy, i. 73
Ileus, see Intestinal Obstruction, v. 757; also this Index.
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ichthyol in, v. 639
potassium sozoiodolate in, vii. 585
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The Rockhart type of impetigo, apt to run into furunculosis, and possibly sepsis, is referred to by Unna (Berl. klin. Woch., May 3, 1915) as being frequent among soldiers, and liable to become chronic. Pus cocci become installed in neighboring hair follicles, ready to start new impetigo or furuncles, and must be isolated from the healthy skin with a coating of ichthyol or mercury-phenol plaster, or a paste of zinc, sulphur, chalk and turpentine. The pustules themselves should be burned out with a hot metal point or pure phenol. In extensive pyodermia all pustules must be opened and the entire body rubbed thoroughly with any soap, except tar soap. The zinc paste is then applied.

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Implantation of nerves, viii. 260
  of sex glands, vii. 360

Impotence.

Impotence, or impotency, signifies inability to carry out properly the sexual act, *i.e.*, to have sexual intercourse in a normal manner, whether actual inability to supply spermatozoa exists or not. Castration after puberty fails to abolish potency, except after considerable time. Intromission of the penis by virtue of its erect condition and a subsequent ejaculation of fluid are the 2 essential conditions of potency.

Varieties and Causes.—*True* impotence is due to some physical deformity or disease, while *false* impotence is of psychic origin only. The former type is less common, and includes cases due to a sharply bent condition of the penis when erect, tumors of or near the penis, elephantiasis of the genitals, pronounced hypospadias or epispadias, tight urethral stricture causing dribbling of semen after subsidence of erection instead of ejaculation during erection, posteriorly directed ejaculatory ducts causing discharge of the semen into the bladder, abnormal or very small size or absence of the penis, a tight phimosis, and a hydrocele, ankylosis of the thigh near the abdomen, or excessive abdominal panniculus rendering the approximation necessary for intercourse impossible. True impotence may also be caused by organic disorders of the nervous system preventing erection or ejaculation or both, or by old age. A temporary true impotence may occur in the drunken state or chronic alcoholism, in drug habitués, from excessive use of tobacco, from marked lowering of vitality, and from continued sexual abuse. A eunuch is often impotent, but not necessarily so.

False impotence may even be merely an attitude of the mind. It may arise from some emotional shock, or be due to indifference toward the partner or to sexual perversion. Many cases are the result of incomplete or evanescent erection and premature ejaculation—a frequent consequence of excessive sexual excitation. In *nervous* impotence, the individual, though not lacking in sexual desire or energy, and in fact sexually hypersensitive, is unable to have a satisfactory erection in actual intercourse, the erection being inhibited by excessive excitement, the memory of a previous signal failure in coitus, perhaps the result of some external condition not under his control, or the fear of impotence *per se* engendered by the reading of quack advertisements. In some other instances, the impotence is imaginary, the subject being merely less powerful sexually than others with whom he compares himself.

Treatment.—In true impotence this consists in correction, in so far as possible, of the deformity, infection, intoxication, or other condition causing it. Where sexual excess or overexcitement is a factor, **rest of the function** for a time is indicated. To excite the sexual function, the measures available include an **ample diet, rich in phosphorus; cold baths; sea bathing; hot or cold affusions locally; counterirritation with mustard;** general **massage** or **rubbings** with a brush, and excitant drugs. **Strychnine** is of recognized value. **Phosphorus,** $\frac{1}{40}$ grain (0.0015 Gm.) a few hours before intercourse, later cautiously increased, directly increases sexual desire (Keyes). **Yohimbine, ergot, iron,** and **cannabis Indica** have also been recommended. **Cantharis,** in doses of 5 to 8 minims (0.3 to 0.5 c.c.) or less of the tincture, with or

without full doses of **nux vomica** and tincture of ferric **chloride**, is likely to prove useful in impotence resulting from sexual excess, but tends merely to excite erection without influencing sexual desire, and must be used with caution. In impotence due to organic impairment of the testicles, **testicular extract** is of service.

In nervous impotence the probable emotional cause of the condition should be ascertained, and the individual so reassured and encouraged that full use of what sexual power is available will be favored. Wrong impressions should be corrected, and the exact sexual capacity inquired into, that he may be warned of the risk attending excessive activity, and relieved of disappointment, even after prolonged sexual rest. A stay in the country, preferably with plenty of exercise, together with **tonics**, is often of value. to eliminate former pernicious mental associations or habits and restore confidence.

The use of **anterior lobe pituitary body**, in 6 cases of impotence aged from 35 to 62 years, with more or less marked improvement, is reported by T. C. Stellwagen (N. Y. Med. Jour., Nov. 4, 1916), 2½ to 5 grains (0.16 to 0.3 Gm.) being given 3 times daily, together with tonics, **prostatic massage**, and regulation of diet.

- **Bier's hyperemia** in, v. 597, 599
- **cannabis indica** in, iii. 9
- **cantharides** in, iii. 13
- **capsicum** in, iii. 15
- **chromium sulphate** in, iii. 338
- **ergot** in, iv. 572
- **gold** in, v. 74
- **hypnotherapy** in, viii. 421
- **orchitic extract** in, i. 785
- **phosphorus** in, vii. 455
- **strychnine** in, vii. 150
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Incontinence of urine, see Enuresis, iv. 516; also this Index.

Indian hemp, see Cannabis indica, iii. 1; also this Index.
- method of rhinoplasty, viii. 442; see Surgical Anaplasty, viii. 433
- pink, see Spigelia, viii. 200

Indican, tests for, v. 647-649, 652

An improved test for indican in the urine is described by Askenstedt (Jour. Labor. and Clin. Med., May, 1917) as follows: Dilute to a specific gravity of 1.005. Warm 10 c.c. in a test tube until its lower end begins to feel hot to the hand. Add 8 c.c. of chloroform, shake, and add 10 c.c. of 0.4 per cent. Perchloride of iron in concentrated hydrochloric acid. Stopper the tube, and shake 2 minutes horizontally. Let chloroform fall to the bottom, pour off most of supernatant fluid, fill tube nearly full with water, and invert a few times to wash chloroform. Any excess of blue beyond a mere trace implies a corresponding excess of indican. The reading should be made as soon as the chloroform settles.

Indicanemia.

Rosenberg (Münch. med. Woch., Jan. 25, 1916), seeking to determine the extreme limit of normal indicanemia, concluded that the Obermeyer-Tschertkoff test begins to give a positive response just about where the high blood indican implies actual renal insufficiency.

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- **buttermilk** in, v. 654
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- **asafetida** in, ii. 190
- **belladonna** in, ii. 446
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with diarrhea, **nitric acid** in, vii. 46
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of infants, chronic, **sea-water solution** in, viii. 188
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Induction of premature labor, see Premature Labor, Induction of, vii. 633; also this Index.
Inebriety, see Alcoholism, i. 538; also this Index.
Infant feeding and nursing, see Nursing and Artificial Feeding, vii. 110
Infantile convulsions, see Convulsions, Infantile, iii. 616; also this Index.
diarrhea, see Diarrhea, Infantile, iv. 69; also this Index.
myxedema, ii. 717; vii. 668
Infantile paralysis, viii. 217

Symptoms, viii. 218.—Analyzing 400 cases of anterior poliomyelitis in the 1916 epidemic, S. A. Jahss (Jour. Amer. Med. Assoc., Mar. 10, 1917) found that 8 per cent. showed *no* evidence of muscle paralysis, 78 per cent. had involvement of the lower extremities, 38 per cent. of 1 extremity only, and 20 per cent. of some of the trunk muscles. In 13 per cent. 1 or more cranial nerves were involved, most commonly the seventh. The *tibialis anticus and quadriceps extensor* were *oftenest involved* in the leg, the deltoid in the arm. The reaction of degeneration proved entirely fallacious for judging the extent of muscular paralysis.

Diagnosis, viii. 222.—According to George Draper (Trans. Amer. Med. Assoc.; N. Y. Med. Jour., June 30, 1917), mothers of children who have had acquired poliomyelitis often show *symptoms of hyperthyroidism*, especially where 3 or 4 children have shown high susceptibility to the disease. In at least 50 per cent. of the cases even muscular weakness never develops. A physical sign of impotence is the spine sign. Any manipulation causing anterior bending of the spine causes pain, and is resisted.

As to treatment, **convalescent human serum** freely given has definite and often striking power to prevent paralysis, especially if given within 30 hours of the appearance of meningeal signs. The injection should be given by gravity very slowly, pressure on the choroid plexus being dangerous.

Etiology, viii. 224.—In the 1916 epidemic of poliomyelitis, according to L. K. Shaw (Trans. Amer. Med. Assoc.; N. Y. Med. Jour., June 30, 1917), the figures for New York State showed 50 per cent. of the patients under 5 years of age, but in New York City 80 per cent. Doubtless in the cities adults had developed immunity from frequent exposure, thus accounting for this difference. Ninety-eight per cent. acquired the disease within ten days of contact; 60 per cent. within three days. Three weeks' quarantine is ample protection. The incidence always followed transmission along the most frequent routes of travel.

Experience in recent epidemics has shown, according to F. Tilney (Trans. Amer. Med. Assoc.; N. Y. Jour., June 30, 1917), either that comparatively few people are susceptible to the disease, or else that it is not very contagious, for there were few group or family cases during the 1916 epidemic, and the incidence in hospitals and institutions for children was negligible. Contagiousness has not been proved the cause of this epidemic; infection by carriers seems most likely. Though the opportunities in the city are better for contact, the incidence in rural districts was higher; hence, some element other than contact must be considered.

A peculiar streptococcus was isolated by Rosenow, Towne and Wheeler (Jour. Amer. Med. Assoc., Oct. 21, 1916) from the throats, tonsils, tonsillar abscesses, and central nervous tissues in cases of infantile paralysis, capable of producing typical flaccid paralysis in a variety of laboratory animals when injected intravenously or intracerebrally. The coccus was isolated, in turn, from the nervous tissues of the injected animals. The organism was remarkably polymorphous, growing in a large and an extremely small form, the latter passing through a Berkefeld filter. Both forms were infectious, and one could be produced from the other. Nuzum and Herzog (Jour. Amer. Med. Assoc., Oct. 21, 1916) and G. Mathers (Jour. Infect. Dis., Jan., 1917) isolated somewhat similar, and possibly identical, organisms.

Pathology, viii. 225.—LaSalle Archambault (Trans. Amer. Med. Assoc.; N. Y. Med. Jour., June 30, 1917) found that the foci of disease in the cord and brain stem always coincided almost absolutely with the area of distribution of the vertebral arteries, and thinks it likely that the virus is carried directly into the bulbomedullary parenchyma through the blood, and that the first irritation affects the central sympathetic cell complexes, causing a reactive vascular spasm of the vertebral arterial system, with consequent venous reflex, transudative edema and migration of cellular elements.

Prognosis, viii. 225.—A physiological fact not generally known is pointed out by C. L. Dana (N. Y. Neurol. Soc.; N. Y. Med. Jour., Dec. 23, 1916), viz., that the motor cells of the spinal cord increase in number from birth to adult life. According to Kaiser, in the anterior horn at birth there are about 100,000 cells and at 15 years 200,000 cells, the increment resulting from the development of cells into full sized function cells. Thus there is always hope in young children that nature will assist enormously the work of the therapeutist in poliomyelitis.

absolute quiet in, viii. 228

Among 77 cases treated by P. M. Lewis (Med. Rec., Sept. 23, 1916) with **adrenalin,** as recommended by Meltzer, there were 18 deaths, of which but 5, or 6.9 per cent., are considered failures of the adrenalin treatment. The bottle of 1:1000 solution was first placed in a bath of boiling water to drive off the chloretone. Spinal puncture was made between the fourth and fifth lumbar vertebræ, intraspinal pressure relieved, and 2 c.c., of the adrenalin solution injected. This was repeated every 6 hours day and night until the temperature was normal.

argyrol in, viii. 228

braces in, viii. 229

After the 35th day of the disease J. J. Nutt (L. I. Med. Jour., Nov., 1916) begins measures for the resulting paralysis, chiefly **braces** to support the member, relieve strain on weakened muscles, and yet permit some motion in normal planes, with limitation of excessive motion by unopposed normal muscle. Two hours each day the brace should be removed, and the child allowed to move about on the floor or bed. At night a **hot bath** should be given, with or without **sea salt,** and the child encouraged to move the member while in it. The full range of each motion should be completed by the attendant, to prevent contractures. After the bath, **muscle training** should be given. **Massage** requires great caution. **Mechanotherapy** should not be used, and no surgical operation be considered in the first 2 years.

chinosol in, viii. 228

counter irritation to spine in, viii. 228

Infantile paralysis (*continued*).
  diet, non-stimulating, in, viii. 228
  disinfection of nose and throat in, viii. 228
  electricity in, iv. 420; viii. 229
  ergot in, viii. 228
  exercise of parts in, viii. 229

Preventive treatment of deformity, according to Royal Whitman (Med. Rec., Dec. 16, 1916), consists in moving the **joints** of the affected part through their full range of motion at least **twice a day,** that all muscles may be extended to their normal limit.

  hexamethylenamine in, viii. 228
  hydrogen dioxide in, viii. 228
  ice-bags in, viii. 228
  laxatives in, viii. 228

Lumbar puncture as a therapeutic measure is advocated by Le Boutillier (Amer. Jour. Med. Sci., Feb., 1917). It should be done every 12 to 24 hours in some cases; every 3 or 4 days in others, or only when increased pain and restlessness or irritability point to pressure by spinal fluid.

  massage in, viii. 229
  phenacetin in, viii. 228
  potassium bromide in, viii. 228
  sera in, viii. 228, 229

Flexner and Amoss (Jour .of Exper. Med., Apr., 1917) deem it established for monkeys, and probable for man, that intraspinal injection of **immune serum** in poliomyelitis is curative. They attribute any therapeutic effect of *normal* serum in man merely to the escape of immunity principles in the blood, made possible by the aseptic inflammation set up by the serum in the meninges. As these principles appear in the blood only after several days, and the favorable effects of *immune* serum relate to the first days of illness, the use of normal serum is not indicated, while that of immune serum is.

A. Zingher (Jour. Amer. Med. Assoc., Mar. 17, 1917) emphasizes the need for every early administration of **serum;** this can be met only by early diagnosis, even in the absence of typical signs, viz., by bedside examination of the spinal fluid, which shows a ground glass opacity, and forms an abundant, lasting foam when shaken. Serum may then be injected at once, the diagnosis being confirmed by later microscopic and chemical examination of the fluid. Normal serum seems to cause marked benefit, though possibly not as great as that from immune serum.

Of 51 preparalytic cases treated with **immune serum,** as reported by F. W. Peabody (Boston Med. and Surg. Jour., May 3, 1917), 35, or 69 per cent., recovered without paralysis; 11, or 21 per cent., recovered with paralysis; and 5, or 10 per cent., died. Of 60 paralyzed cases treated with the serum, 8, or 12 per cent., showed definite rapid improvement; 33, or 51 per cent., did not, and 21, or 32 per cent., died.

According to C. W. Wells (Jour. Amer. Med. Assoc., Oct. 21, 1916), **immune serum** is best given intravenously, or both intravenously and intraspinally. The intravenous dose should be 50 to 100 c.c. daily, and more if obtainable. Each injection should be followed by lumbar puncture, and withdrawal of some spinal fluid. In small infants and children it may be necessary to give the serum intramuscularly. In each of 15 cases there was prompt benefit, though this was only transitory at times, and 4 cases died.

  silver, colloidal, in, viii. 228
  sodium salicylate in, viii. 228
  splints in, viii. 229

Even early in the disease, according to Bass (Arch. of Pediat. Aug., 1916), drop-foot should be guarded against by using a frame or cradle to keep the covers from touching the foot, and the nurse be warned against tucking in the bedclothes tight. The foot of a **paralyzed extremity** should be held at right angles with a sandbag against the sole or a strip of adhesive about the ball of the foot running up on the leg. Fingers should be kept partly extended.

G. W. Robinson (Jour. Kans. Med. Soc., Mar., 1917) states that **aspirin** gives much relief from pain, though in some cases **morphine** may be needed. Another method is to fix the parts in suitable positions of **rest.** After the acute stage, the best support of extremities is obtained by fitting a **celluloid splint,** removable for re-educating the muscles.

Treatment to restore the affected muscles, as R. W. Lovett (Jour. Amer. Med. Assoc., Apr. 7, 1917) points out, should not begin until all tenderness has disappeared. Fatigue must be avoided. The upright position must be encouraged after two or three months, if necessary, with light **braces,** which should, however, be worn only when the patient is standing or walking. The most effective treatment is **muscle training,** carefully adjusted to the condition of each muscle, and given only by the physician or one specially trained.

To relieve pain and dissipate infiltrations, F. E. Peckham (Amer. Jour. of Electrotherap., and Radiol., Oct., 1916) recommends early use of the **static wave current,** applied over the lumbar spine for twenty minutes. The affected muscles are then exposed to a 500-candle power **lamp, screened with blue glass,** for a like period. **Vibration treatment** is applied to the muscles, followed by **gymnastic movements.** The splints are removed for these treatments, given 3 times weekly.

- **strychnine** in, vii. 149; viii. 229

Finding foci of pus in the tonsils, from which the typical organisms could be isolated, in a number of cases of prolonged fever, and at times late paralysis, J. C. Roper (L. I. Med. Jour., Nov., 1916) **removed the tonsils** in patients, usually after the end of the third week, with marked benefit.

G. A. Rueck (Med. Rec., Sept. 30, 1916) reports 3 cases treated successfully by **transfusion** of whole blood from healthy adults, prepared with 2 per cent. **sodium citrate solution.**

Infantile paralysis (*continued*).

- **tricycles** in, viii. 229
- operative treatment, viii. 229
  - **arthrodesis** in, viii. 230
  - **articular transposition** in, viii. 231
  - **astragalectomy** in, viii. 231
  - **insertion of bone** in, viii. 230
    - **of periosteum** in, viii. 230
  - **myotomy** in, viii. 230
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  - **tendon lengthening** in, viii. 230
  - **tendon shortening** in, viii. 230
  - **tendon transplantation** in, viii. 230, 511

C. Wallace (Amer. Jour. Orth. Surg., xiv, 400, 1916) states that **transplantation of** an active **hamstring tendon,** when both are normal, to the attachment of the paralyzed quadriceps extensor tendon so improved power about the knee that braces could be discarded. Arthrodesis for paralytic deformities in children was of little value. Grooving the tibialis anticus tendon into the anterior surface of the tibia, and transplanting the extensor proprius hallucis tendon to the calcaneo-scaphoid ligament, proved helpful for equino-valgus deformity. The typical **Whitman operation** was most satisfactory for calcaneus, calcaneovalgus, and dangle-foot deformity.

- **tenotomy** in, viii. 230
- prophylaxis, viii. 226
  - **disinfection of stools and urine** in, viii. 226
  - **hexamethylenamine** in, v. 531; viii. 226
  - **hydrogen peroxide** in, viii. 226
  - **isolation** in, viii. 226

Prophylaxis, viii. 226.—Among 21,746 children in 93 institutions under permanent jurisdiction of the Health Department of New York City, but 10 proved cases developed, according to Kerley (Arch. of Pediat., Jan., 1917). Three of these developed within two weeks of admission, and 3 others had been allowed to mingle with city children in a public park. This low morbidity is ascribed to the strict quarantine established in these institutions.

- **menthol nasal irrigation** in, viii. 226
- abortive form, viii. 222

According to Martin (Can. Med. Assoc. Jour., vii. 113, 1917), the *abortive type* comprises 35 to 56 per cent. of all cases, and is the most dangerous as regards dissemination. During epidemics all persons with an acute infection should be regarded as suspects.

In the abortive type, states L. Fischer (Med. Rec., xci, 52, 1917), the temperature may rise no higher than 101° F., (38.3° C.), and last but one or two days, with apathy, headache, extreme lassitude, and sometimes pain in the arms and legs. In some, the symptoms even pass after one day, the child regaining his appetite and being as bright as usual. The reflexes may be slightly exaggerated.

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encephalic form, viii. 221
Landry's form, viii. 221
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  arsenic in, v. 659
  beef-juice (raw) in, v. 656, 658
  blood-picture in, v. 657
  codliver oil in, v. 659
  cows' milk (fresh raw) in, v. 656, 658
  fruit-juice (fresh) in, v. 659
  iron in, v. 659
  orange-juice in, v. 656, 658, 659

Subacute and latent forms of infantile scurvy, according to A. F. Hess (Jour. Amer. Med. Assoc., Jan. 27, 1917), are very common among artificially fed infants in the larger cities where the whole milk supply is pasteurized. In latent scurvy the diagnosis rests largely upon prompt gain in weight and general improvement following addition of orange juice to the diet. To prevent these forms of scurvy in babies fed mainly upon pasteurized milk, **orange juice** should be begun when the infant is a month old with a dose of a teaspoonful daily, to be increased so that at three months a tablespoonful is taken.

  potatoes in, v. 659

The white potato is efficacious (according to the Med. Rec., Sept. 30, 1916), and is within the reach of the poorest family. One tablespoonful of mashed potato to 1 pint (½ liter) of water is added to the twenty-four hours' feeding of milk in place of the usual cereal diluent. The potato can be added to the water in which it is boiled, and thus all the vitamines conserved.

  rest in, v. 659
  sodium citrate in, v. 656
  sodium lactate in, v. 659

Scorbutus in a ten months' old baby was treated by G. A. Rueck (Med. Rec., Jan. 27, 1917) with **transfusions of citrated maternal blood**, the patient being unable to produce enough gastric, enteric, and pancreatic secretion to digest food, as shown by a complete lack of appetite for five days. Results were good, the child drinking modified milk from a cup immediately after the first blood transfusion, and subsequently recovering.

  vegetables (fresh) in, v. 659
  yeast (fresh brewers') in, v. 659
tremor, viii. 578
uterus, viii. 743
Infantilism.

In infantilism, according to E. Bosworth McCready (Ills. Med. Jour., Oct., 1914), with skeletal undergrowth, quantitative and qualitative, the small sella turcica, high carbohydrate tolerance, polyuria, absence of perspiration, and of pubertal changes, all point to an etiological complex with hypopituitiarism as a prominent factor. The sudden growth response to pituitary feeding tends to confirm this assumption, though possibly a mere coincidence. L. Ferrannini (Riforma médica, May 22, 1915) repudiates a lack of vital force as cause, and regards infections (tuberculosis, syphilis, rheumatism and diphtheria) and intoxications (alcoholism, morphinism, and mercurialism) as predominating factors.

H. Climenko (Amer. Jour. of Dis. of Children, Dec., 1916) reports a case in which bony projections in the sella turcica pressed on the pituitary. There was high sugar tolerance, deficient ossification and anemia. **Pituitary gland** caused an increase in weight, but not of stature.

genital, **yohimbine** in, viii. 833
pancreatin, **opotherapy** in, vii. 299
Infarction, iv. 438
intestinal, see Intestinal Infarction, v. 734; also this Index.
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Infected wounds, see Wounds, Septic, viii. 814; also this Index.
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toxemias of, **intravenous infusion** in, viii. 804
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gastritis, viii. 363
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Inferior polioencephalitis, acute, see Bulbar Paralysis, Acute, ii. 695; also this Index.
Infiltration anesthesia, **eucaine hydrochloride** in, iv. 700, 702
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ichthyol in, v. 636
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of the ovary, see Oöphoritis, vii. 239; also this Index.
of the spinal cord, see Myelitis, viii. 231
of spinal nerves, vi. 803
of the thymus, viii. 534
Inflammations (*continued*).
of the tubes, see Fallopian Tubes, Inflammation of, vii. 240; also this Index.
superficial, **cataplasma kaolini** in, vi. 176
lead and laudanum in, vi. 314
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Inflammatory conditions, **alcohol** in, i. 532
diseases of women, **saline solution, hypertonic,** in, viii. 191
neoplasms, see Mycosis Fungoides, vi. 775; also this Index.
Influenza (la grippe), v. 659

Diagnosis, v. 667.—In 500 cases of typical influenza, Shera (Lancet, Mar. 24, 1917) found that *the soft palate, uvula and posterior pharyngeal wall* invariably showed *vesicles* about the size of a pin's head, and nearly always accompanied by erythema. He concluded that this throat syndrome was pathognomonic in this particular epidemic. Leo-Wolf (Med. Rec., Feb. 5, 1916) also noted in children a *punctate erythematous eruption* on the chest, abdomen, and sides of the limbs, resembling scarlet fever.

Etiology, v. 668.—Improper foot covering is responsible for a large percentage of cases, and superheated apartments with poor ventilation lower resistance to cold, according to A. H. Doty (Med. Rec., Mar. 11, 1916). Heilbronn (Münch. med. Woch., July 6, 1915) noted that the general health of troops kept good until extra hard work in the rain for two days was necessary; 105 developed sore throats or bronchitis in consequence, and 37 typical influenza. All came down at once. Isolation proved useful. Practically all the cases of pneumonia observed by Harlow Brooks (Trans. Med. Assoc. of Greater City of N. Y.; N. Y. Med. Jour., Dec. 16, 1916) during the 1916 epidemic of influenza, had had some additional and predisposing factor, as exposure, overwork, dissipation, etc. Pneumonia occurred in none of the cases in which the patient was persuaded to go to bed and live an invalid life from the outset for a few days. The predisposing conditions apparently formed a very important factor.

R. Raimondi (Presse méd., May 11, 1916) observed that at the end of October, in November, and in December, influenza in nurslings is relatively mild, lasting as a rule only from three to five days. In the second week of January the severity increases, the disease being most virulent from March until early in May.

Prophylaxis.—To prevent influenza, cerebrospinal meningitis, eruptive fevers, and mumps in troops, Lefas (Presse méd., June 29, 1916) extols the Vincent method, after trying it in 600 young soldiers. These were ordered to wash out the mouth and gargle with **Lugol's solution** or with a 5 per cent. dilution of **Labarraque's solution (liquor sodæ chlorinatæ, U. S. P.)**. The cases of angina or pharyngitis markedly diminished, immediately increasing 3-fold when the procedure was discontinued for a week, and promptly dropping to *nil* when it was resumed.

acetanilide in, i. 227; v. 674
acetphenetidin in, i. 251; v. 674, 677, 678
acetylsalicylic acid, in, ii. 220; v. 674
aconite in, i. 283
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antipyrin in, ii. 42; v. 674
argyrol in, v. 674, 676
arsenic in, v. 672, 675
atropine in, ii. 449; v. 677

Treatment, v. 672.—C. H. Duncan (Med. Standard, Mar., 1916) asserts that **autotherapy** usually cures acute influenza in twenty-four hours if the following simple technique is properly employed. Mix sputum 1 dram (4 c.c.), distilled water 1 ounce (30 c.c.), in a 2 ounce (60 c.c.) bottle, shake well, and allow to stand twenty-four hours. Filter through a Berkefeld filter. Inject 20 minims (1.25 c.c.) of the bacteria-free filtrate into the loose cellular tissue over the biceps muscle. Give no further dose until the patient ceases to improve under the preceding dose.

Influenza (*continued*).
bacterial vaccines in, ii. 400
balsam of Peru in, v. 674
belladonna in, v. 676
benzoin in, v. 674
bone-marrow (fresh) in, v. 675
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caffeine in, v. 674, 677, 678
calcium chloride in, ii. 718
calomel in, v. 675, 676, 678
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codeine in, v. 675, 676
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counterirritation in, v. 675, 676
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glycerin in, v. 676
guaiacol in, v. 675
heat in, v. 676
heroin in, v. 675; vii. 189, 190
hot baths in, v. 675

W. A. Onderdonk (Amer. Med., Jan., 1917) gives **hot malted milk** or **hot lemonade** to counteract the initial chill. In addition, the patient should be kept warm with blankets and hot water bottles.

[While these "home" remedies are apparently simple, they have an eminently scientific bearing in the sense that by activating the efficiency of the cellular ferments by the heat liberated they promote the antitoxic and even the bactericidal process. C. E. de M. S.]

hot nasal douche in, v. 677
hot packs in, v. 675
hydrogen dioxide in, v. 676
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Influenza (*continued*).
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  ichthyol in, v. 674
  iodine glycerole in, vi. 7
  iron in, v. 676
  isolation in, v. 672
  massage in, v. 677
  menthol in, v. 674
  mercury bichloride in, vi. 680
  morphine in, v. 677
  mustard in, v. 675; vi. 774
  novaspirin in, v. 675
  nux vomica in, v. 674, 675; viii. 57
  opium in, vii. 190
  phenocoll in, vii. 438
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  chloretone in, iii. 218
  digitalis in, iv. 158
  duboisine in, iv. 347
  head douches in, viii. 811

Symptoms.—Bonhoeffer (Deut. med. Woch., Sept. 24, 1914) states that when psychoses appear among troops, serious breaches of discipline may occur. One subject became disoriented in battle and fired upon his comrades. A sergeant-major repeatedly disobeyed orders, and was found to be a paretic. An officer, clearly in the twilight state, left his command and started home. The medical attendants may become excited, and develop acute psychoses. Such men should be weeded out as soon as they become excited. While organizing commands, and during musters, much may be done in eliminating subjects of psychopathic constitution; for these are likely to give way under severe discipline, forced march, etc., to say nothing of actual fighting.

The military psychoneuroses are divided by Grasset (Presse méd., Apr. 1, 1915) into 3 groups: 1. The *sensitivo-motor,* in which the paralysis appears at first much more marked than is actually the case; the patient can be made to perform, slowly and with effort, movements of which at first he was incapable. The contractions differ from those of organic spinal disease in that the tendon reflexes are not exaggerated, while the anesthesia is superficial only, usually involving but one-half of the body, or even a segment of a limb. In some cases the patient exhibits spinal curvature, pain, and tenderness; or sympathetic disturbances of circulation, respiration, or digestion. 2. The *sensorimotor,* in which sight, hearing, and speech are abolished, owing to some violent commotion, such as the bursting of a shell. 3. The *emotional* group, with disturbances of sleep, altered disposition, emotional outbursts by pressure on hysterogenic spots, such as the scar of a wound, the inframammary region, the angle of the scapula, or the iliac fossa. Cases of moderate intensity can be successfully treated with **hot baths, static electricity, massage, mechanotherapy, motor re-education, tonics,** and **psychotherapy.** The most severe cases must be sent home or aggregated in special hospitals, where isolation and expert treatment can be applied.

Etiology.—A deficiency of protein or excess of fat, starch, and sugar in the dietary, according to Mercier (Lancet, Mar. 11, 1916), excite in some instances confusion, depression, periodical screaming, emotional hyperexcitability, defects of memory, and even hallucinations.

From a study of 1283 cases by means of the Wassermann reaction, Vedder and Hough (Jour. Amer. Med. Assoc., Mar. 20, 1915) conclude that syphilis among white women is comparatively rare, while among white men it was demonstrated in 20 per cent. They estimate that at least 30 per cent. of white males in the Government Hospital for the Insane were syphilitic, and at least 10 per cent. of the insanity in that institution is directly attributable to syphilis.

The chief etiological factor of *war psychoneuroses,* according to S. A. Suchanoff (Roussky Vratch, May 9, 1915), is concussion due to the terrific explosions of heavy artillery. It either causes traumatic disturbances of the fine structures of the nervous system, resulting in traumatic neuroses, or else produces emotional shock, with marked hysterical manifestations. Llwellys F. Barker (Jour. Nerv. and Mental Dis., July, 1916) holds that a distinction should be made between the psychoneurotic disturbance due to battle shock and that complicated by a psychopathic tendency, which only awaits, in order to become active, extreme conditions such as the exigencies of war present. Sudden and violent abnormalities in reaction are inevitable. Their occurrence, however, does not reduce the importance of the unconscious mental life in the production of the mental phenomena as against the conception of pathological causes which attributes them to the immediate traumatic agent. The precipitating cause applies, in other words, the spark to the unconscious material.

Auer (Amer. Jour. of Insanity, Oct., 1914) holds that the occurrence of insanity at *puberty and adolescence* after severe physical and mental strain, and at the time of menopause—all periods when the metabolic changes of the body are intense—and also the occurrence in syndromes unquestionably the result of disease of the glands of internal secretions. Idiocy, imbecility, depression, mania and dementia suggest strongly that the true etiology of the affective psychoses lies in a functional disturbance of the ductless glands.

Pathogenesis.—F. X. Dercum (Jour. Amer. Med. Assoc., Apr. 15, 1916) recalling that Fauser realized that the Abderhalden method could prove of great significance for psychiatry, reaches the following conclusions: 1. When either through defective organization, or disease, abnormal substances find their way into the blood, defensive ferments are evoked. 2. The ferments thus produced are often injurious to substances other than those which gave rise to them, the cortex in dementia precox, for example, and perhaps also in paresis. 3. When no defensive ferments can be found, the affection is one unattended by organic changes and belongs to some purely functional group, *e.g.,* to manic-depressive insanity or to the psychasthenic psychoses. 4. Where, as in terminal dementia precox, the disease has run its course, a poisonous substance may no longer appear in the circulation, and defensive ferments are no longer formed. 5. The toxicity in manic-depressive insanity and in other functional states seems due to a quantitative rather than a qualitative change in substances normally present. However, the symptoms are always due to toxic agents, for substances in excess or abnormally deficient would have all the values of poisons.

H. A. Cotton, E. P. Corson White, and W. W. Stevenson (Jour. Nerv. and Mental Dis., Feb., 1917), after Abderhalden tests in 289 cases, and some normal individuals, the substances used being pituitary, thymus, thyroid, pancreas, adrenal, and sex glands, conclude that the Abderhalden reaction gives certain definite and uniform results. In dementia precox 81 per cent. of the cases showed a positive reaction to sex gland, and 3 out of 55 gave a positive reaction to thyroid and sex glands; 2 of these were of the catatonic type. Differential count of the blood shows rather characteristic conditions in dementia precox, high red blood-cells, low white cells, high lymphocyte and low polymorphonuclear count.

Prophylaxis.—In a hospital near the firing line for nervous and mental affections, in charge of Roussy and Boisseau (Paris méd., Jan. 1, 1916), fully 34 per cent. of the men were back in the trenches in two or three weeks through prompt attention. Those with merely functional disturbances were thus saved from getting into ruts. It also permitted the detection at once of organic troubles requiring the specialist.

Treatment.—Comparative studies of 3000 sections of the pituitary, pineal, thyroid and sexual glands from normal and insane persons led Rupert Farrant (Brit. Med. Jour., June 24, 1916) to conclude that all of these glands react to certain toxemias, first by hypertrophy, then by atrophy. Two forms of treatment are suggested: If there is hypertrophy and overactivity of 1 or more of these glands, attempts should be made to **locate the causative toxemia** and cure it. This will most commonly be found to be in carious teeth and intestinal stasis. When there is atrophy of the glands their secretions should be artificially supplied, and good results should be expected from **organotherapy** if undertaken before definite cortical brain lesions occur.

Melancholia is the only member of the manic-depressive group which can, according to F. X. Dercum (N. Y. Med. Jour., Mar. 13, 1915), be successfully treated outside of institutions, and this only when it is mild. The best results are secured by **rest,** as carried out in the treatment of neurasthenia. The tendency to suicide must be specially guarded against. One is rarely justified in committing to the ayslum cases of *psychasthenia.* Many of these patients present evidences of *hypothyroidism.*

Chavigny (Paris méd., Jan. 1, 1916), referring to *army practice,* insists on the importance of treating psychic, nervous and any condition, digestive, motor, etc., as early as any physical lesion that may be present. Patients generally expect and do better when, along with re-education, in motor and sensory disturbances, given some medicine—some containing **eucalyptol,** for example. The **faradic current** is always an effectual means to re-educate the sensibility when applied properly, as he describes. The mental disturbance due to explosions, shell shock, etc., proved rapidly curable in 95 per cent. of the cases.

Daniel (Jour. Mental Sci., Oct., 1914) states that *severe hyoscinism* is produced within three to six weeks

when scopolamine hydrobromide or hyoscine is given in frequently repeated doses hypodermically, whereas by mouth it may be administered for as long as six months before the symptoms assert themselves. The earliest symptom is an intense restless excitement, with vivid hallucinations, soon followed by rapid emaciation, and finally a well-marked paresis of various muscles, which, if unrecognized, would soon end in death. The patient foams at the mouth, chatters incessantly, and is never still for a moment; when approached by nurses, fights them. Its use in repeated doses hypodermically should be avoided.

gold in, v. 74
nucleinic acid in, vii. 110
pituitary preparations in, i. 781
scopolamine in, viii. 102
sulphonal in, viii. 426
thyroid gland in, i. 741

E. Goodall (Lancet, Dec. 5, 1914) attributes his relatively large proportion of failures with **thyroid gland** in cases of *stupor* and *stupor with melancholia,* or of *confusional insanity*—which have certain features in common with myxedematous cases—the last two years, to the circumstance that he gave insufficient doses of thyroid. When given in doses of 25 to 50 grains (1.6 to 3.2 Gm.) a day for five to eight weeks, the results were highly satisfactory, since 6 patients of 11 became well, while all the others, except 1 deranged for three years, showed a definite improvement.

G. H. Hickling (Brit. Med. Jour., Sept. 18, 1915) reported a case of *stuporous insanity* in a child of 12 years, cured by **thyroid extract** in 1 month.

Turkish bath in, viii. 813

An analysis of 1000 packs given at the Psychopathic Hospital, Boston, by Adler (Boston Med. and Surg. Jour., Nov. 9, 1916) tended to show that excitement in conditions other than manic-depressive insanity is to be considered rather as a secondary manifestation, and one which is more easily controllable by **wet packs.**

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    bed-rest in, vii. 697
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Insanity (*continued*).

- insolational, vii. 703
- insomnia of, **methylene blue** in, vi. 686
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- lactational, vii. 699
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- postfebrile, vii. 700
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Insomnia.

Varieties and Etiology.—Apart from the sleeplessness symptomatic of certain forms of mental disease, insomnia may arise from a number of different causes, such as pain, coughing, dyspnea, fever, mental strain or shock, intoxication, and senility. Toxic insomnia may result not only from alcoholism but from the excessive use of tobacco or of coffee or tea shortly before bedtime, or from endogenous toxic products tending to maintain cerebral hyperemia, such as those formed because of intestinal stasis, renal insufficiency, or the gouty diathesis. In senile insomnia, diminution of elasticity or possibly of vasomotor control of the cerebral arterioles is believed to be responsible. Brain tumor and cerebral syphilis are other causes. In a large number of instances the cause of the insomnia will be found to be merely an improper mode of living, frequently involving the excessive use of stimulants in the attempt to keep working at high pressure.

Intermittent insomnia is held at times a manifestation of periodical psychosis by Gilbert Ballet (Presse méd., Feb. 17, 1916). This variety is characterized by (1) the exaggerated stress laid by the patient on the discomforts of his sleepless periods; (2) marked depression during the daytim with lessened zest for work, and morbid preoccupations; (3) sleeplessness, often at once reaching its maximum, and later disappearing suddenly; and (4) recurrence at protracted intervals, sometimes with excitement and later depression.

Treatment.—The use of hypnotic drugs is, as a rule, merely a palliative measure, and since their continued employment tends toward habit formation, treatment directed toward removal of the cause of the insomnia, where this is possible, is far preferable. Such removal of the cause consists, *e.g.*, in the appropriate medical or surgical treatment of conditions causing pain, of feeble heart action in cardiac dyspnea, of bronchial or pulmonary diseases in the presence of cough, of infectious processes in the presence of fever, of constipation, renal disease, etc. In toxic insomnia the intoxicant must be withdrawn, and in that due to worry or other strain the patient removed from the harmful influence responsible. Where detection or complete removal of the cause proves unattainable, or for the purpose of encouraging the patient before the causal treatment has had time to bear fruit, medicinal or preferably hygienic, physical, and dietetic methods may be availed of. **Prohibition of mental activity in the evening**, a moderately **warm bath** or shower, followed by general **massage** and a little **hot milk** with crackers, before going to bed, are frequently effective measures. A fairly long walk or other **exercise** in the afternoon, or a short walk in the evening, may be helpful, especially in subjects with sedentary occupations. Where there is arteriosclerosis and a tendency to high blood-pressure, the **evening meal** should be **light**, and taken early. In the presence of hysteria, or even in other cases, a **placebo** of starch or prepared chalk in a capsule, coupled with forceful verbal **suggestion**, may prove highly efficacious. In some subjects, accustomed to worrying over inconsequential matters while abed, earnest recommendation that they endeavor on retiring to dismiss everything from their minds, except sleep may prove helpful. Where there is acute inflammatory pain, an **icebag** or **hot-water bag** to the involved region is often sufficient. Hot-water bottles in bed will promote sleep where the latter is interfered with by cold extremities.

Drugs should be as much as possible avoided, especially when the patient cannot be kept under close supervision. In the milder cases, the **bromides** in doses of 15 to 30 grains (1 to 2 Gm.) at bedtime, are the safest and frequently efficient remedies. **Chloral hydrate**, 8 to 20 grains (0.51 to 1.3 Gm.) is more powerful and certain in the severe cases, though at times slightly irritating to the stomach. **Veronal**, 5 to 15 grains (0.3 to 1 Gm.), acts more strongly than was originally supposed. Sulphonmethane (**sulphonal**), 15 to 30 grains (1 to 2 Gm.), and sulphonethylmethane (**trional**), 10 to 25 grains (0.65 to 1.6 Gm.), are effectual, but somewhat slower in action, especially the former. **Paraldehyde**, 30 to 60 minims (1.9 to 3.7 c.c.), is a good hypnotic, but imparts an ethereal odor to the breath for hours and even days after its administration.

Opium and **morphine** are of especial value where there is pain, but their use should, as a rule, be restricted to acute cases, the possibility of engendering the habit being always borne in mind. **Codeine sulphate**, ¼ to ¾ grain (0.016 to 0.048 Gm.), used for 1 or a few days, is often useful as a substitute for opium or morphine in cases attended with pain or dyspnea, in which measures directed against the underlying cause of the condition require a little time to develop their effects. Scopolamine (**hyoscine**) hydrobromide, 1/300 to 1/100 grain (0.00021 to 0.00065 Gm.), is deemed of especial value where an incessant flow of thoughts impedes the oncoming of sleep, or where the latter is disturbed by excessive dreaming. **Hyoscyamus** preparations in conjunction with chloral hydrate are sometimes used in hospitals for the insane; the **cold sheet pack**, with a covering of blankets, is a valuable adjuvant in the insomnia of insanity, and also in the presence of fever.

A combination of hypnotics in reduced doses often acts powerfully, and with reduction in the side-effects of each drug used. Alternation of hypnotics, if they must be kept up, for a period, is also advisable to reduce the probability of a gradual increase in tolerance and habit formation. For children, **sodium bromide** in appropriate doses is by many considered the best hypnotic; ethyl carbamate (**urethane**) may act more powerfully, but is less even in its effects. In some cases of chronic insomnia, as from protracted mental strain, or in nervous women, anemia seems to play a causal rôle, and should be treated with **iron, arsenic,** and a **generous diet.** In toxic insomnias and those associated with high blood-pressure, **purgation** is at times of service, tending to reduce cerebral hyperemia. In senile insomnia, frequently rather obstinate, an effort should be made to restrict medication to **bromides,** used in conjunction with physical and other non-pharmaceutic measures.

In insomnia in the presence of intestinal putrefaction with toxemia, William Martin (N. Y. Med. Jour., Jan. 1, 1916) urges a low protein or protein-free diet. In insomnia in general the bedroom should be **quiet,** well ventilated, and easily darkened. Some method of **autosuggestion,** such as counting backward or thinking of pleasant things may be advisable. The patient should be assured, to obviate worry about not sleeping, that 10 hours of rest awake equal 6 hours of sleep. Business men with insomnia should have their **hours regulated** so that some **recreation** can be worked in, such as golf or tennis: Frequent short vacations are helpful.

Electrical treatment of hypertension by the autocondensation method is of great benefit in suitable cases. The static wave current to the spine, using a long narrow metal plate, with a 10- to 12- inch spark gap for 20 minutes, reduces spinal irritability and leaves a sedative effect. **Mechanical vibration** over the interspaces of the second and third, and third and fourth dorsal vertebræ helps greatly in the hypertension type of cases. Abdominal vibration with the ball vibratode will relieve splanchnic congestions, while vibration of the neck will relieve a full feeling in the head.

Hydrotherapy is excellent, most simply as a foot bath, with or without mustard. Iced **cold cloths** can be applied **to the head. Local packs** to the legs or abdomen may be serviceable. The **general bath,** started warm and allowed to cool till there is decided dilatation of the skin vessels, followed by **friction** or light **massage,** is another good method. Some react well to being placed **wet** between 2 **blankets** on retiring. **Sitz baths,** heated to tolerance, with an **ice cap** or **cold cloths** to the head, forehead, and eyes, are of value in some cases.

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- Interphalangeal joints, resection of, vii. 792
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  - **nitric acid** in, vii. 46
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- Intestinal adhesions, **physostigmine** to prevent formation of, vii. 459
  - anastomosis of, i. 63; v. 465, see also Enteroanastomosis, this Index.
  - anastomosis.

Neither lateral nor end-to-end anastomosis being entirely satisfactory, G. L. McWhorter (Jour. Amer. Med. Assoc., Jan. 8, 1916) recommends a right-angle anastomosis modified from the circular *end-to-end* method in that the bowel is cut at an angle of 45 degrees. The mesenteric portions are approximated first by a mattress suture, which, when tied on the inside, occludes the uncovered area of the bowel and invaginates the edges. With a needle on each end of this suture, the sutures are continued around so that this mesenteric half is first sutured accurately with a hemostatic buttonhole stitch. These are then continued as Connell sutures, ending opposite the mesentery. A Dupuytren stitch is then taken outside the first stitch to approximate a wide area of serosa. A few stitches join the mesenteries. If the ends are of unequal size, one may be cut more obliquely, or an incision may extend up opposite the mesentery. The right-angle union has a rich blood supply, and the angle of the vessels toward the union lessens the danger of the second row of sutures causing gangrene of the inverted margin of the bowel. There is, therefore, less danger of leakage, contraction, and stenosis. The writer also describes a notch enterorrhaphy, which he holds advantageous.

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cancer.

Diagnosis.—In cases of unexplained loss of weight and diminished strength, with secondary anemia in adults over 40 years, particularly with gastro-intestinal symptoms, J. Burke (N. Y. State Jour. of Med., July, 1915) advises consideration of cancer of the colon. Likewise where a tumor is present in any of the 4 corners of the abdomen, and in sudden profuse hemorrhage from the bowel. Upon the slightest suspicion of colonic derangement the *X-ray* should be used.

In the few cases of tumor of the large intestine in which the bismuth or barium meal passes rapidly, and in which there are no suggestive shadows of neoplasm, H. Schlecht (Med. Klinik, Sept. 24, 1916) recommends a bismuth and barium enema. A tumor will usually cause obstruction to the enema at the growth, with dilatation of the distal intestine, and desire to expel the enema.

Bensaude and Guénaux (Arch. des Mal. de l'Appareil Digestif, ix, No. 3, 1916) much prefer *barium sulphate* as a gelatinous precipitate to bismuth for the X-ray examination. The vehicle used is a mixture of 2.5 Gm. gum acacia; 7.5 Gm. gum tragacanth; 1 Gm. gluten; 2 Gm. agar, and 10 Gm. glycerin. This emulsifies 200 Gm. of gelatinous precipitate of barium sulphate (equivalent to 100 Gm. of the dry salt).

Pathology.—In pathological studies G. L. Cheatle (Brit. Med. Jour., Feb. 7, 1914) ascertained that cancer of the large intestine is usually closely confined to the submucous layer. Its extent is usually not greater in the intestine than is indicated by the involvement of the extramural lymphatics. This involvement thus gives the surgeon a guide to the extent of necessary resection.

Prognosis.—According to W. J. Mayo (N. Y. Med. Jour., June 24, 1916), the chances of recovery in operations for cancer of the second half of the large intestine are greater than in any other part of the body except the lip and fundus of the uterus. In a large series of cases observed 5 years after operation, there were 52 per cent. of cures. In another series observed 3 years after operation there were 67.5 per cent. of cures. Even where the small intestine is involved, and 3 or 4 resections are necessary, with end-to-end anastomoses, the prognosis is favorable. Where the uterus is involved, it, with cervix, tubes, and ovaries, is removed *en masse* with the resected large intestine. Where possible, end-to-end anastomosis is done, but otherwise colostomy is proper.

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Célestin Vichy water in, v. 711, 712
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cocaine in, v. 713
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In 256 cases of acute colon bacillus enteritis in soldiers in the trenches, often with 6 to 30 movements a day, and blood in 51 per cent. of cases, Lassablière (Bull. de l'Acad. de méd., Mar. 7, 1916) found the best treatment to be daily ingestion of 1 to 2 liters (quarts) of a mixture of 1 part of condensed milk with 4 of rice water. The number of stools was thus reduced to 1 a day after 2 to 4 days, and the average stay in the hospital from 26 to 15 days. Opiates may be added for sharp colicky pains, and calomel and lactic ferments for malodorous stools.

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disorders, Bier's hyperemia in, v. 594
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hot compresses in, viii. 814
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fermentation, betanaphthol in, ii. 464

Some subjects, according to L. Wolff (Hygiea, lxxviii, No. 9, 1916), have a limited capacity for digesting cellulose, and above this the stools soon exhibit the fermentation type, with diarrhea and symptoms of dyspepsia and neurasthenia. The stools are semifluid or fluid, light yellow, foamy, and highly offensive, with odor of acetic and butyric acid. When mixed with water, undigested potato is noted as round lumps, but there is little mucus, muscle residue, or soap. In 2 years 10 cases of this type were met with. In the treatment, all farinaceous food must be restricted for a long time, and for the first few days the patient should live on well cooked meat, fish and gelatin preparations, eggs, bouillon, milk, tea, light wines, and a little more sugar than usual. A little honey, infants' artificial dextrinated foods, fine wheat flour dishes and tapioca may then be added, and, later, toast and biscuits, purées of fresh young green vegetables, stewed fruits and preserves. Potatoes and uncooked vegetables

and fruits are prohibited. **Hydrochloric acid, pepsin** and **pancreatic ferments** are added where indicated, and 0.05 Gm. (5/6 grain) **guaiacol carbonate** and 0.1 Gm. (1½ grains) **nux vomica** are also given. A course of **natural iron mineral waters** with some **saline mineral water** concludes the treatment.

  nux vomica in, vii. 148
  sulphur in, viii. 429
foreign bodies, v. 759, 765
gangrene, in hernia, v. 464-468
hemorrhage, **atropine** in, ii. 451
  calcium lactate in, ii. 717

Allan (Prescriber, May, 1916) notes that in soldiers returning with dysenteric symptoms, with blood and mucus in the stools, a hypodermic injection of ⅓ grain (0.02 Gm.) **emetine hydrochloride** once daily caused rapid disappearance of the blood and the diarrhea.

  gallic acid in, iv. 793

In hemorrhage from gastric or intestinal ulcers, including those of typhoid fever, Nottebaum (Deut. med. Woch., Dec. 4, 1913) recommends **tincture of iodine** by mouth in small doses at short intervals.

  iron subsulphate in, vi. 89
  opium in, vii. 188
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infection.

The importance of infections of the mouth, nose, and throat in the etiology of infections of the gastro-intestinal tract is definitely established, according to A. F. R. Anderson (L. I. Med. Jour., x, 102, 1916), and the treatment of infective lesions of this tract must include **autogenous vaccines** derived from any accessible foci of infection, and early removal of the foci. For prophylaxis, prompt attention should be paid to all mouth, nose, and throat infections as soon as discovered.

A condition of the colon often wrongly diagnosed as tuberculosis is described by Lynch and McFarland (N. Y. Med. Jour., June 24, 1916). The onset is sudden, with temperature 104° to 105° F. (40° to 40.5° C.), severe diarrhea, early appearance of blood, mucus, and foul pus. Rapid emaciation and extreme prostration follow. Digestive disturbances are slight. The mucosa has a "fish spawn" appearance, and bleeds easily. The condition may become chronic. The bacterial flora is apparently normal. The prognosis depends upon prompt treatment, which consists of **irrigations** of **potassium permanganate**, 1: 5000, or **hydrogen peroxide**, 1 dram (4 Gm.) to 1 pint (500 c.c.) of water. **Ileostomy** gives prompt relief.

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injuries, i. 60, 132, see also Intestinal Rupture and Wounds, this Index.
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  Dover's powder in, v. 698
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obstruction (ileus), v. 757

Etiology, v. 762.—According to G. H. Whipple (Jour. Amer. Med. Assoc., July 1, 1916), the intoxication in intestinal obstruction is due to a primary proteose, which, upon injection into animals, reproduces the symptoms. In peritonitis and acute pancreatitis the same proteose causes the toxic symptoms. In all these conditions there is a marked rise in the non-coagulable nitrogen of the blood.

Treatment, v. 768.—According to Cooke, Rodenbaugh and Whipple (Jour. Exper. Med., June, 1916),

transfusions of dextrose solutions are often of benefit in intestinal obstruction.

In postoperative ileus, E. O. Kane (Amer. Med., July, 1914) finds the **faradic current** very satisfactory. The metal plate, covered with moist gauze, is placed under the small of the back and held with a folded towel. The sponge electrode is moved slowly and firmly up and down the entire abdominal surface, excepting the wound area. The current is gauged according to tolerance and muscular contractions. From 10 to 15 minutes of treatment are usually necessary at 1 sitting. Then or within a half-hour free expulsion of gas begins.

In postoperative ileus, Gibson (Annals of Surg., Apr., 1916) always gives **pituitary extract** intramuscularly, 1 cc.. (16 minims) being repeated every hour up to 3 doses, then every 2 hours, not exceeding 5 doses in 24 hours. This may be re-enforced by a suitable enema.

In cases of intestinal obstruction in the terminal stages of toxemia, W. M. McCabe (Jour. Amer. Med. Assoc., Apr. 22, 1916), under **morphine** and local **novocaine anesthesia, opens** a **knuckle of ileum** as low down as possible, above the obstruction, between 2 purse-string sutures. A **Pezzar catheter** is inserted and held by the first purse string, and if it is to remain some days the second purse string is tied, inverting the first. If it is to be removed immediately, the first purse string is loosened and the opening closed with the second. While the bowel is emptying itself through the catheter, the point of obstruction is sought, and, if found, dealt with. If the patient's condition forbids the search, the catheter remains several days. Normal saline is given in abundance by **hypodermoclysis** and **enteroclysis.** Of 70 patients operated on, 50 per cent. were saved.

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  avoid purgatives in, v. 768
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Intestinal obstruction, acute (*continued*).
  bile in, i. 798
  enemas in, v. 769

J. M. Perret and H. T. Simon (Jour. Amer. Med. Assoc., Jan. 27, 1917) point out that in acute intestinal obstruction due to worms, not relieved by purgatives given orally, a **purgative enema** will often bring relief.

  gastric lavage in, v. 769
  hormones in, i. 800; v. 766
  infiltration anesthesia in, laparotomy for, iii. 497
  inflation of bowel in, v. 769
  irrigation with saline in, v. 769
  morphine in, v. 770
  physostigmine salicylate in, v. 770
  posture in, v. 769
  saline solution in, v. 769
  succussion in, v. 769
  sulphur in, viii. 428
  surgical measures in, i. 57; v. 769

In cases of late operation for intestinal obstruction, J. C. Johnston (Med. Rec., Jan. 2, 1915) **clamps** the **lower segment** of intestine and **irrigates** the upper as far above the obstruction as may be easily reached, **using sterile water** or half-strength **salt solution.** None of the material above must enter the empty and thirsty intestine below the obstruction. He then **clamps** the **upper segment** and slowly **instils** half-strength **salt solution** into the lower segment with a view to saturating it, guarding against later rapid absorption of harmful products.

The technique for **short-circuiting** in intestinal obstruction advised by Thompson (Surg., Gynec. and Obstet., June, 1916) consists in making a lateral anastomosis, if possible, between healthy ileum above and ileum just proximal to the ileocecal valve, this portion being seldom involved in ileus. An **appendicostomy** or **cecostomy** is done for drainage and introduction of fluids. Good results are obtained in inflammatory ileus by **enterostomy** and **drainage** in cases too ill for more radical measures. Upon recovery, ileo-ileal anastomotic closure of the enterostomy wound and cecostomy or appendicostomy are indicated.

In cases of partial or complete obstruction of the lower colon and sigmoid unsuited for radical operation, J. Y. Brown (Jour. Amer. Med. Assoc., Aug. 12, 1916) selects the right side for an **artificial anus** because it can be rapidly made, admits of immediate, proper drainage of the distended bowel above the obstruction, completely excludes the large bowel, and practically avoids odor.

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chronic, v. 759
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magnesium sulphate in, vi. 474
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In postoperative intestinal paralysis and in that of acute diseases, such as pneumonia and typhoid fever, A. J. Colton (Buffalo Med. Jour., July 1916) gives **pituitrin** hypodermically with excellent results. In a case of pneumonia with refractory meteorism and very low blood-pressure, 0.5 c.c. (8 minims) of pituitrin, injected slowly into the median cephalic vein, caused within 30 seconds the expulsion of much gas and an enormous stool, the abdomen in less than 3 minutes returning to its normal size. Cyanosis disappeared, and rapid convalescence ensued.

parasites, see Parasites, Diseases Due to, vii. 303
perforation, **saline solution** in, i. 148
in abdominal injuries, i. 146
in abdominal surgery, i. 17
polyposis, see Intestinal Tumors, this Index.
putrefaction, **bile acids** in, i. 799
magnesium purgatives in. vi. 473
resection, **iodine disinfection** in, vi. 33
rupture.

In traumatic rupture of the duodenum, according to D. Cheever (Boston Med. and Surg. Jour., Sept. 23, 1915), local pain, muscle spasm, tenderness, increasing pulse rate, later vomiting, perhaps shifting dullness in the flanks, and leucocytosis unless the toxemia be overwhelming, constitute the symptomatic picture. If the rupture be retroperitoneal, a tender tumor, not shifting, in the right hypochondrium and umbilical region, with shock, will after a time give the clue. If intraperitoneal, the effusion may cause pain not so marked at the point of rupture as in the iliac fossæ or pelvis. Absence of liver dullness is rarely dmonstrable in the early curable stages of perforative peritonitis.

In 3 cases of traumatic rupture of the small intestine reported by Frank Radcliffe (Brit. Med. Jour., Apr. 18, 1914), all in strong men, there was a history of having been suddenly dragged by extended arms. The fixed first part of the jejunum was torn transversely in each case. All of the patients died, their symptoms not being definite until the condition was hopeless. A patient with a history similar to the above should be operated upon.

In 2 children, 7 and 8 years old respectively, in whom rupture of the small intestines resulted from a fall in 1, and from being struck by an automobile in the other, operation was promptly performed by L. Davis (Boston Med. and Surg. Jour., Feb. 4, 1915), and the patients recovered. In such cases he deems profuse and thorough **peritoneal irrigation** a lifesaving measure.

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belladonna in, v. 756
colonic irrigation in, v. 756
diet in, v. 756, 757
laxative waters in, v. 756
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Hoffmann's anodyne in, v. 699
simple follicular ulcers, v. 707, 749
spasm, v. 698
eumydrin in, iv. 706
stasis.

Symptoms.—These are summarized by our Associate Editor, Anthony

Bassler (N. Y. Med. Jour., Nov. 6, 1915) as follows: (1) attacks of abdominal distress, generally epigastric or right iliac, not associated with food taking; (2) tenderness in the right ileum and hepatic flexure; (3) constipation, sometimes preceded by abdominal pain or alternating with diarrhea and mucous discharge; (4) sense of gas distention in right abdomen, possibly causing a palpable and splashing cecum; (5) symptoms of intestinal intoxication, viz., malaise, lack of energy and endurance, headache, backache, anorexia, muddy complexion, rings about eyes; stained armpits, groins, and popliteal spaces; malodorous breath; neurasthenic symptoms, abdominal and general; and loss of weight or standstill in spite of appropriate dieting; (6) functional eye symptoms; disturbed reflexes; neurotic insomnia; slow or rapid heart rate; causeless urethral distress; coccygodynia; pains in left hip, flank and subscapular region; (7) prolonged stoppage of bismuth at certain points in the intestine (often fallacious, if taken alone).

Etiology and Pathology.—In general, the condition underlying the stasis may be classed as either functional (atonic or nervous, including reflex) or primarily mechanical. J. J. Johnson (Southern Med. Jour., ix, 342, 1916) lays stress, for example, on irritation of one of the sphincters,—pylorus, ileocecal valve, and anal sphincter,—in its relation to spasm of the sphincter higher up. Thus, pylorospasm due to chronic appendicitis will cause a "delay toxemia," characterized by repeated soreness in the right side preceded by toxic headaches without colic. In advanced cases there is a thickened terminal ileum and distorted, infected colon, right-sided colectomy being the only remedy.

According to Keith (Proc. Royal Soc. of Med., Oct. 15, 1915), stasis is due to defective innervation. He describes 6 nodal regions, at the junction of the esophagus and cardia, pylorus, third portion of duodenum, junction of jejunum and ileum, lower extremity of ileum, and distal colon. These nodes regulate the rhythmic contraction of the musculature, and in specimens from operation and autopsy he found gross pathological changes in the fibers of Auerbach's plexus corresponding to the nodal areas.

G. C. Boughton (Internat. Jour. Surg., xxix, 359, 1916) states that duodenal kinking is usually secondary to dropping of the lower end of the ileum, and is not permanent. In the hepatic region the effect of slight narrowing of the gut is very marked. The splenic flexure being firmly fixed, there may be a long rise from the dropped ascending and transverse colon, and feces be retained for days in the latter. The sigmoid is often of adhesions which result in narrowing, kinks, diverticula, or lengthening.

According to Arbuthnot Lane, stasis is due to the dragging of an atonic intestine on peritoneal bands, this resulting in obstructing kinks. B. Quarelli (Gior. d. r. Accad. di med. di Torino, lxxix, 191, 1916), from an extensive study of the literature, 230 cadavers, and clinical cases, concludes that the mode of production of a *Lane kink* is not always the same, and thinks it cannot be shown that there is a newly formed band in the sense described by Lane. As for *Jackson's membranous pericolitis,* he accepts the theory of congenital origin of the membrane, believing it a persisting right epiploic diverticulum. *Herz's insufficiency of the ileocecal valve* may be due to anomalies of formation, ectasia of the cecum, chronic inflammatory processes, contracture of the ascending colon and consequent increase of cecal pressure, and specific lesions (ulcer, tuberculosis, etc.). Quarelli finds this disturbance especially concomitant with cecal ectasia and chronic morbid processes.

The mechanical stasis occurring in the ileocecal segment alone may be either a stasis due to ileal inflexion; stasis in the cecum and ascending colon; stasis to obstruction at the left colic angle, or stasis due to sigmoidal alterations. The first 2 are the most important, and lead to phenomena of general intoxication. Ileal stasis clearly depends on Lane's kink, but stasis of the right colon may be due either to habitual torsion of the cecum; ceco-colic inflexion; membranous pericolitis; peritonitis secondary to affections of the appendix, biliary passages, etc.; or to primary or secondary insufficiency in the muscular tone of the cecum, with a correspondingly varied surgical treatment, according to the cause found.

McClure (Proceed. Royal Soc. of Med., Feb., 1916) considers Lane's bands and Keith's plexus changes both late events, secondary to low grade inflammation due to bacteria or toxins passing through an atonic intestinal wall. Sometimes, however, infection may precede stasis. Certain definite skin areas corresponding to Keith's nodes were noticed, which when stimulated, caused reflex stimulation of the nodal areas and intestinal contraction.

Diagnosis.—In a series of 136 cases of chronic intestinal stasis studied by G. R. Satterlee (Amer. Jour. Med. Sci., clii, 727, 1916), constipation was noted in 84 per cent. and diarrhea in 30 per cent. In 6 per cent. bowel movements were normal. Colica mucosa occurred in 43 per cent., marked flatus in 76 per cent., loss of weight in 60 per cent., mental symptoms (from simple inefficiencies to melancholia, epilepsy, delirium and stupor) in 40 per cent., and nerve symptoms (neuralgias, etc.) in 65 per cent. Motility is ascertained from the X-ray. Intestinal ptoses may exist to any degree without causing symptoms. Enteroptosis was absent in only 22 per cent. Gastric constipation, determined by remnants of the bismuth or barium meal 6 hours after ingestion, was noted in 54 cases, and ileal constipation in 3. Obstruction by Lane's kink was relieved by operation in 1 case. Cecal constipation, determined by remnants of bismuth or barium 48 hours after ingestion, was present in 42 per cent., and apparently responsible for much of the symptomatology. Colonic delay of 48 to 72 hours was noted in 9.5 per cent., and of 72 hours or over in over 50 per cent. Sigmoid constipation, the sigmoid failing to empty in 3 days, was noted in 34.5 per cent., and associated with cecal constipation in 16 per cent. Of the entire series, 25 per cent. had had their appendices removed without lasting benefit to the chronic condition.

As a basis of comparison in the X-ray detection of intestinal stasis, Hugh Walsham (Arch. of Radiol. and Elect., Jan., 1916) states that normally a shadow appears in the ileocolic region within 4 hours after a bismuth meal. In 8 hours this is in the colon. The transverse colon is reached 6 hours later, the splenic flexure in 9 hours, and the brim of the pelvis in 11 hours. In 18 hours most of the bismuth is in the distal part of the pelvic colon and the superior pelvic chamber of the rectum. These are average figures.

Ochsner (Surg., Gynec. and Obstet., Jan., 1916) warns that without a complete history and careful physical examination, the X-ray examination is likely to lead to error. To be of value, it must be conducted by the clinician who follows his surgical cases into the operating room.

Treatment.—**Fleiner's oil cure,** which consists of injecting into the rectum 250 to 500 c.c. (½ to 1 pint) of olive oil is advocated by C. D. Aaron (Buffalo Med. Jour., Aug., 1916). Pure cottonseed oil yields equal benefit. The oil should be retained over-night, if possible. The injections are continued several months, at first daily, later every other day, and finally twice a week. They are useful both in spastic and atonic constipation. Where there is putrefaction the **Bulgarian bacillus** in liquid or tablet form may be prescribed. Its efficacy is enhanced by a **diet** preponderantly **carbohydrate,** with restriction of proteins. Poorly nourished patients should be well fed by **forced feeding** if necessary. **Cold water, half baths,** and the **Scotch douche on** the **abdomen,** with **rubbing** and **slapping,** are valuable; likewise **respiratory gymnastics** several times a day and **dry rubbing** of the skin with rough towels. **Massage** will strengthen the abdominal muscles, and **bandaging** the abdomen acts beneficially. All the patients need **iron,** but the sovereign remedy is **atropine** or **belladonna.** In the *atonic type,* requiring a different treatment, the **diet** should be bulky, with agar and fruits and vegetables rich in cellulose. **Petroleum jelly** of the best quality seems to act better than Russian mineral oil.

Abdominal kneading is recommended by J. S. Bolton (Brit. Med. Jour., Mar. 31, 1917). It is practised by the patient himself while lying relaxed in a warm bed. With both hands warm and flat upon the abdomen, the cecum is emptied by gentle, increasing pressure made backward and upward and continued for at least 2 minutes; the hands then follow the ascending colon, continuing deep pressure; next the right hand makes pressure forward in the loin while the left anteriorly squeezes the hepatic flexure; the gall-bladder is then emptied by the finger tips under the costal margin; next the transverse colon is kneaded toward the spleen and the splenic flexure emptied like the hepatic; the kneading is finished over the sigmoid. The treatment is taken night and morning in chronic cases, for 15 to 20 minutes. A heavy **ball of shot** may replace the hands for much of the kneading.

Immunization by subcutaneous injection of **autogenous colon bacillus vaccine,** 50,000 bacteria up to a million or more, is recommended by C. R. Satterlee (N. Y. Med. Jour., June 17, 1916). The injections are given at 5 to 7 days' intervals. The patients quickly respond to this treatment.

F. B. Turck (*loc. cit.*) advises the **injection** of 300 c.c. (10 ounces) of **warm water into** the **colon** and the use of a **rubber bulb,** to pump air, for setting up antiperistaltic movements. By thus exercising the entire colon, its debility is overcome.

A. J. Ochsner (Surg., Gynec. and Obstet., Jan., 1916) reports that in the year 1914 he operated to correct intestinal stasis in 36 cases, with 32 recoveries and 4 deaths. Only a small percentage of stasis cases need be surgically considered, viz., those in whom there is a possibility of overcoming it by removing tumors pressing on the intestine, or by correcting uterine displacement, obstruction due to bands, adhesions, or marked kinking, strictures following ulcer, annular carcinoma, or occasionally large papillomata, fibromata, or lipomata. If the obstruction cannot thus be relieved, short circuiting must be resorted to, and if the colon is dilated and permanently out of commission, at least the cecum and ascending colon should be removed; in severe cases one may have to remove the entire colon down to the sigmoid.

The **Gillet operation** for stasis is described by the same author (Ills. Med. Jour., Aug., 1916) as a promising procedure. The ileum is anastomosed with the lower end of the sigmoid, and the upper segment of the sigmoid passed through a buttonhole in the abdominal wall on the left side. The distal end of the ileum is closed and dropped back in the abdomen. The colon is not disturbed by this operation, and what little mucus gathers in it can be washed away by an enema once a week through the colostomy opening.

According to J. S. Horsley (Va. Med. Semi-Mthly., Apr. 13, 1917), correction of angulations and ptosis by **suturing,** as in the Coffey operation, and **division of obstructing bands,** will possibly correct intestinal stasis in most cases. Where the cecum has become a cesspool and is greatly dilated, **anastomosis**

with the **sigmoid** seems indicated; occasionally **resection** of the cecum and ascending colon may be advisable, but even then the ileocecal valve should, if possible, be preserved. (See also Colon, Exclusion of, and Ileosigmoidostomy, this Index.)

Stasis due to congenital dilatation of the colon (*Hirschsprung's disease*; congenital megacolon) is a special form of intestinal stasis in which a part or rarely the whole of the colon is markedly dilated, generally with hypertrophy of the bowel wall and elongation of the gut affected.

Symptoms and Diagnosis.—Constipation is noticed, as a rule, in early infancy, even the meconium being passed only with difficulty. Fecal tumors, palpable through the abdominal wall or by rectum, soon form, and are not removable by cathartics. Later the accumulations may be such as to cause marked distention of the abdomen, and visible peristalsis may be observed. Bowel movements may occur only at long intervals. In older children a valvular fold of the mucus membrane may be found upon rectal examination. Where the thoracic viscera are pressed upward by the fecal mass, the respiration may be purely costal and the heart action enfeebled; reabsorption of toxic material may also take part in the latter effect. Emaciation is a natural accompaniment, and apathy, unconsciousness, twitchings, tetany, and convulsions may be met with as toxic nervous symptoms.

Disturbance of the kidneys may occur from pressure on the ureters, and the superficial veins of the abdomen may be found dilated, and the legs edematous. Vomiting and pain are only occasional symptoms. Exertion, straining, vomiting, or operative intervention may cause sudden death from collapse, owing to the weakened condition of the heart, or death may occur from septic colitis or bowel perforation and peritonitis. The diagnosis is based on the symptoms and X-ray examination. The prognosis is rather unfavorable, 75 per cent. of Neugebauer's 35 cases succumbing at an early age from the affection.

Pathology.—Usually the sigmoid is chiefly or exclusively involved; its circumference may attain 50 to 70 centimeters. At times enlargement of other segments, *e.g.*, the cecum and transverse colon, coexists, with the intervening segments quite normal. In the thickening of the bowel wall, the circular muscle layer is more hypertrophied than the longitudinal. Externally the affected gut presents a smooth appearance, the sacculations, teniæ coli, and sometimes the epiploic appendages having disappeared. Kinking of the bowel, commonly at the junction of the sigmoid and rectum, is believed to occur as a secondary change in a majority of the cases, the result being a valve-like fold which accentuates the obstruction and its symptoms.

According to R. J. de Jong (Neder. Tijd. v. Geneeskunde, May 20, 1916), a valve formation in the bowel is the primary factor in certain cases of megacolon. He believes the term megacolon congenitum a misnomer. In a case developing at the age of 44, cured by sigmoid resection, there was a valve-like formation, but the flexure probably had been naturally large, and prolonged constipation had stretched it. Such cases are not true Hirschsprung's disease.

Treatment.—Non-operative treatment, alone appropriate in early infancy, consists in evacuating the bowel as well as practicable with **enemas**, and in continuing nursing as long as circumstances permit. Permanent drainage of the rectum by a **rectal tube** has been advised. Operative treatment is alone satisfactory. In greatly weakened subjects, preliminary institution of an **artificial anus** is frequently advisable to permit of unloading the bowel and improving the general condition. **Resection** of the affected portion of bowel is the best operative procedure. Any **kink** below the enlargement must likewise be **eliminated.**

Of 151 cases treated by internal measures alone, according to Schneiderhöhn (Zeit. f. Kinderheilk, xii, Nu. 4-5, 1915), only 38 were cured and 14 improved; 79 died, and the outcome was unknown in 14 cases. He looks upon megacolon as due to a mechanical closure which peristalsis is unable to overcome. Purgatives, enemas and coarse foods add to the distention, and may lead to rupture at some eroded point. The internal measures succeed best in children, and should be given a prolonged trial first. **Sedatives** should be used for spasm in any part of the bowel. The **sphincter** in spasm should be bloodlessly **stretched. Massage, electricity,** and **diet,** with **bowel irrigations,** will often cure early cases. Of 69 children operated on, 32 were cured and 26 died. **Colopexy** or **resection** at 2 sittings gave the best results.

Stress is laid by R. M. Smith (Lancet-Clinic, Mar. 25, 1916) on a group of cases which have recurring attacks of pain, fever, vomiting, and acute obstructive signs, despite every effort to prevent them. In other cases, constipation will often yield to careful treatment, especially **saline enemata. Massage** helps the abdominal wall, and mechanically moves along fecal material, especially with a drainage tube in the rectum. The **diet** should consist of coarse breads and cereals, green vegetables, and agar-agar. **Much water** should be taken. **Russian oil** is helpful.

A case reported by Ito and Soyesima (Deut. Zeit. f. Chir., xc, Nu. 4-6, 1917) was cured by **incomplete exclusion of the entire colon.** Pseudomegacolon is apt to correct itself in later life—a fact to be remembered when deciding on operation.

stercoral ulcers, v. 750
  enemas in, v. 750
  glycerin in, v. 750
  olive oil in, v. 750
  quinine and urea hydrochloride in, v. 750
Intestinal strangulation, v. 757, 761, 762
  stricture, v. 759, 765
  sutures, i. 26

In strengthening suture lines of the stomach and intestines, L. Freeman (Annals of Surg., lxiii, 83, 1916) deems a free omental graft well suited except when there is actual gaping or great tension. The graft should reach well beyond the suture line, and be firmly secured with many sutures of fine catgut.

toxemia, in newborn, vii. 28
    bowel irrigation in, vii. 29
    breast milk in, vii. 29
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    airol in, i. 486
    appendectomy in, v. 754
    collargol in, iii. 535
    excision of affected nodes in, v. 754
    excision of affected bowel in, v. 755
    hydrochloric acid in, v. 755
    lateral anastomosis in, v. 755
  tumors, v. 759, 765

In multiple adenomata, the chief benign growths of the intestine, the chief danger, according to F. C. Yeomans (Med. Rec., Sept. 23, 1916), is their tendency to change into adenocarcinomata. **Enterostomy** prevents fecal irritation of the tumors, but must be maintained for a long time after their disappearance. Removal of the tumors singly or *en masse* is unsatisfactory. If they persist after enterostomy and prolonged trial of **irrigations,** a partial or total **colectomy** is indicated.

A case of polyposis (benign adenoma) of the colon in a child aged 8, in which the entire colon was successfully removed, with **ileosigmoidostomy,** is reported by H. W. Soper (Amer. Jour. Med. Sci., Mar., 1916). Twenty cases of adenomatous polypi of the sigmoid flexure are also referred to.

  ulcers, see Duodenal Ulcer, v. 737; also this Index.

Intestinal wounds, i. 60, 132, see also Abdominal Wounds, this Index.

Of 52 cases of intestinal wounds treated conservatively by Enderlen and Sauerbruch (Med. Klinik, xi, 823, 1915), 46 died in the field hospital, and 3 later. Among 211 operated cases the mortality was 44.4 per cent. Where the abdomen is tense and painful, the pulse small and frequent, if there is nausea and vomiting, and particularly if costal breathing, there is probably intraperitoneal injury, and operation is indicated whether the intestine is injured or not.

In gunshot wounds of the *duodenum* and *colon*, according to O. Richards (Brit. Med. Jour., Aug. 7, 1915), simple suture is necessary and sufficient. In the *jejunum* and *ileum*, however, simple closure is unnecessary and inefficient. Death in such cases is not usually due to escape of feces and peritonitis, but to intestinal paralysis and distention spreading upwards from the injured coil. The proper course is to resect the injured portion, and also as much above it as is likely to constitute a functional obstruction. This amount depends on the number and relative position of the wounds, and it increases with delay. Withholding water from such patients is condemned. The water probably never reaches the wounded area.

The case of a private operated on within ½ hour after receiving a penetrating wound of the abdomen is reported by J. H. Stephen (Brit. Med. Jour., Oct. 30, 1915). End-to-end anastomosis was performed with the greatest speed and rather rough and ready materials. Rapid recovery followed. Many cases of abdominal injury might be saved if dealt with on the spot by the field ambulances.

Verhaeghe (Rev. gén. de clin. et de therap., xxx, 120, 1916) points out that in penetrating abdominal wounds a lateral laparotomy sometimes suffices for closing and repairing perforations in the small bowel. A small lateral iliac incision avoids exposure to sepsis may be warranted.

Studying the process of repair in wounds of the small intestine, McWhorter, Stout, and Lieb (Surg., Gynec. and Obstet., July, 1916) found that union in sutured intestinal wounds became permanent in from 7 to 10 days. The denuded surface was covered with an immature mucosa usually in 23 days, and regeneration of the mucosa was complete after 2 months. Complete regeneration of the muscularis did not occur, it being always interrupted by a thin line of scar tissue.

diseases of, v. 694, see Intestinal Disorders, etc., this Index.
surgical diseases of, i. 57
Intra-arterial anesthesia, iii. 500
infusion, v. 681
Crile's method, v. 682
Dawbarn's method of, v. 682
Intracranial angiomata, ii. 516
hemorrhage, blood-pressure in, ii. 493
traumatic, v. 191
surgery, technique, etc., v. 175
Intranasal operations, quinine and urea hydrochloride anesthesia in, iii. 395
Intraocular tension, determination of, holocaine in, v. 537
high, physostigmine in, vii. 460
Intraorbital neuralgia, menthol in, vi. 649
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Intravenous anesthesia, iv. 686; viii. 198
infusion, v. 678; viii. 198
formulæ of artificial sera, v. 678
injection, see Intravenous Infusion.
Intubation, anesthesia by, iv. 679
of larynx, v. 784
after-treatment, v. 794
antitoxin in, v. 795
Casselberry's method of feeding in, v. 794
gavage in, v. 12
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obstruction of tube, v. 795
atropine in, v. 796
codeine in, v. 796
remove and cleanse tube in, v. 795
sodium bromide in, v. 796
prolonged use of tube, v. 797

In cases already tracheotomized, S. Iglauer (Laryngoscope, xxvi, 1089,

1916), after intubation, fixes in the intubation tube with a silk thread tied in a shallow groove filed round the tube. The thread and groove are saturated with melted paraffin to remove sharp edges. After intubation the thread is drawn out with forceps through the tracheal fistula, and fastened to the skin with adhesive.

Leto (Pediatrica, Nov., 1916), for the same purpose, in untracheotomized cases, passes a long, curved needle through the thyrohyoid membrane, a little below the hyoid, with a forefinger in the pharynx. The attached silk thread is fastened to the laryngeal tube, the latter introduced, and the thread tied to a strip of gauze round the throat.

preliminary medication, v. 790
  antitoxin in, v. 795
  caffeine sodium benzoate in, v. 790
  strychnine in, v. 790
recurring stenosis, v. 799
  use of coated tubes in, v. 790, 799
tubes, coating for, v. 790, 799
  alum-gelatin in, v. 790

Prolonged intubation often gives rise, according to H. Mallet (Revue méd. de la Suisse rom., Aug., 1915) to the formation of ulcers in the cricoid region, provoking edema below the glottis and laryngeal spasm. In such cases he uses a thick paste of alum, starch, water, and a little glycerin applied freely to the tube, which is then allowed to dry a few hours and inserted. The alum acts very satisfactorily on the ulcerations. The alum coated tube is recommended whenever intubation exceeds 150 hours or the tube upon removal shows black or white spots indicative of ulceration.

  europhen-paraffin in, v. 790
  ichthyol-gelatin in, v. 790, 799
  iodoform-paraffin in, v. 790
Intumescent rhinitis, see Rhinitis, Intumescent, vii. 75
Intussusception, v. 757

Of 38 patients with intussusception tabulated by L. Miller Kahn (Med. Record., Apr. 29, 1916) 35 came to operation. Thirty-three, or 87 per cent., were under 1 year of age. In 9 patients operated on within the first 12 hours the mortality was but 11 per cent. In the diagnosis the X-ray should be tried in dubious cases, if available. Examination under ether should not be attempted unless one is prepared to operate immediately. **Enemata** should, with certain limitations, be tried in every case, but after 2 or 3 fruitless attempts in rapid succession it should be abondoned. **Resection** may be undertaken if the gut is gangrenous, but usually proves fatal. **Enterostomy** is a last resort.

surgical measures in, i. 58

The case of a woman of 45, mother of 10 children, who developed sudden abdominal pain while working in the field, is reported by Minervini (Riforma medica, June 12, 1915). The intussuception found at the laparotomy required resection of the lower ileum, cecum and ascending and transverse colon—two-thirds of the large intestine. There was rapid recovery and total absence of by-effects.

Invagination of bowel in hernia, v. 465
Inversion of the testicle, vii. 349
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Iodides of mercury, vi. 652, 674
Iodine and iodides, vi. 1

In *major operations* L. Boudreau (Jour. de méd. de Bordeaux, Jan., 1916) favors the use of iodine as an internal disinfectant. It is microbicide and antitoxic, stimulates the production of leucocytes and the functions of the glands, especially ductless glands, and tones up the vital functions in general. In *typhoid, puerperal sepsis, epidemic meningitis, measles, scarlet fever,* and *whooping-cough* it aids in subduing the infection and reducing contagiousness, and seems to ward off complications. Small frequent doses must be used, kept up day and night. In whooping-cough he gives 7-year-old children 60 drops of the French tincture in 24 hours. In *tuberculosis* it should be pushed to the limit of tolerance, beginning with minute doses and gradually working up.

Large doses of iodides by mouth irritating the digestive tract, Da Matta (Brazil-Medico, Oct. 14, 1916) gives sodium iodide intravenously, and has had no mishap. Doses of 10 or 20 Gm. (2½ to 5 drams) are thus tolerated by patients unable to stand the least quantity in the stomach. A 10 per cent solution is used. He begins with 5 Gm. (75 grains), gradually increasing to 20 Gm. (5 drams), repeated daily or at longer intervals. Sodium salicylate and iodide, given intravenously in immediate succession, gave excellent results in *acute articular* and *muscular rheumatism* and for the pain in *chronic rheumatism* and *gout*. A little saline solution is injected between the 2 drugs.

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nascent, generation of, vi. 39-44
  Maurice's method, vi. 53
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  acute, vi. 21
    alcohol injections in, vi. 22
    ammonia (aromatic spirit) in, vi. 22
    arrowroot in, vi. 22
    caffeine in, vi. 22
    digitalis in, vi. 22
    egg albumin in, vi. 22
    emetic in, vi. 22
    flour in, vi. 22
    heat (external) in, vi. 22
    ice (crushed) locally in, vi. 22
    lavage (gastric) in, vi. 21, 22
    milk in, vi. 22
    opium in, vi. 22
    starch in, vi. 22
    strychnine in, vi. 22
  chronic, vi. 15

Adrenalin is recommended as a remedy for iodism by G. Milian (Paris méd., May 5, 1917). At least 0.006 Gm. (1⁄10 grain) a day should be given, in 2 doses, and if this prove insufficient, subcutaneous or intramuscular injections of 0.001 or 0.002 Gm. (1⁄10 or ⅕ grain) should be used. It may be used both for preventive and curative purposes, and might save life in laryngeal edema.

Iodine and iodides, poisoning by, chronic (*continued*).
    belladonna tincture in, vi. 20
    calcium permanganate in, vi. 21
    cold-water packs in, vi. 16
    diet poor in nitrates in, vi. 20
    ergotin in, vi. 21
    sodium bicarbonate in, vi. 20
    sulphanilic acid in, vi. 20
  prophylaxis, vi. 19
    ammonium benzoate in, vi. 19
    arsenic (Fowler's solution) in, vi. 19
    calcium in, vi. 19
    dose well diluted in, vi. 19
    initial small dose in, vi. 19
    milk as vehicle in, vi. 19
    skin hygiene in, vi. 19
    sodium bicarbonate in, vi. 19
  stains, removal of, alkalies in, vi. 35
    ether in, vi. 35
    Fowler's solution in, vi. 35
    hydrogen dioxide in, vi. 35
    sodium thiosulphate in, vi. 32, 35
    starch (raw or boiled) in, vi. 35
  test (calomel) for, vi. 9
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    alcohol in, vi. 50
    alcohol frictions in, vi. 50
    belladonna tincture in, vi. 50
    Burow's solution in, vi. 50
    hot bath in, vi. 50
    hot enema in, vi. 50
    hot water in, vi. 50
    ichthyol in, vi. 50
    lime water in, vi. 50
    magnesia (milk of) in, vi. 50
    mustard frictions in, vi. 50
    potassium bromide in, vi. 50
    sodium bicarbonate in, vi. 50
    starch (warm solution) in, vi. 50
  stains, removal of, vi. 53
Iodoformogen, vi. 47
Iodoglycerole, vi. 7
Iodonaphthol, vi. 786
Iodotannin, vi. 6
Iothion, vi. 4, 39
Ipecac, vi. 55
  poisoning by, vi. 57
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Ipecac, poisoning by (*continued*).
    digitalis in, vi. 58
    external heat in, vi. 58
    stomach-tube in, vi. 58
    strychnine in, vi. 58
Iridectomy, vi. 64, 65
  in glaucoma, v. 26, 27
Iridochoroiditis, see Choroiditis, vi. 65; also this Index.

Three cases developing during cerebrospinal meningitis are reported by Lavergne (Arch. de méd. des Enfants, Apr., 1917). Upon suspicion of it ophthalmoscopy is indicated, and if positive, **antimeningococcus serum**, at once injected into the vitreous body, is the only known beneficial measure.

    mercury cyanide injections in, vi. 683
Iridocyclitis, vi. 62
    scopolamine in, viii. 104
  rheumatic, **salicylates** in, viii. 56
Iris, anomalies of, vi. 61
  coloboma of, vi. 62
  cyst of, vi. 68
  diseases of, vi. 61
    dionin in, vii. 191
    chronic, **dionin** in, vii. 182
  gumma of, vi. 68
  inflammation of, see Iritis, vi. 62, 67
  prolapse of, **physostigmine** in, vii. 460
  sarcoma of, vi. 69
Irish moss syrup, see Squill, viii. 317
Iritis, vi. 62, 67

Of 100 cases carefully studied by Irons and Brown (Jour. Amer. Med. Assoc., June 10, 1916), only 23 were due to syphilis, though in 16 others syphilitic infection had occurred. In 18 an alveolar abscess or apical tooth infection, and in 16 the tonsil was the source of infection. Gonorrhea accounted for 9, tuberculosis for 8, and sinus infection for 3. Seventeen cases had several infections.

    alsol in, i. 589
    atropine in, vi. 64
    bacterial vaccines in, ii. 420
    baths, hot and Turkish, in, vi. 64
    Bier's hyperemia in, v. 597
    calomel in, vi. 64
    dark glasses in, vi. 64
    dionin in, vi. 64; vii. 191
    hexamethylenamine in, v. 532

Iritis (*continued*).
    homatropine in, v. 540
    hot bathing of eyes in, vi. 64
    hyoscyamine in, v. 580
    iridectomy after, vi. 64, 65
    mercury by inunction in, vi. 64, 673

In iritis and other eye affections, Müller and Thanner (Med. Klin., xii, 1120, 1916) used **injections** of 5 c.c. (90 minims) of **fresh whole milk**, boiled 4 minutes. Striking and rapid improvement resulted. Favorable results were also noted in corneal opacity, syphilitic keratitis, and in 1 case of gonorrheal conjunctivitis of long standing.

    pilocarpine in, vi. 64
    potassium iodide in, vi. 38
    salvarsan in, iv. 209; vi. 64
    sodium salicylate in, vi. 64
    sodium iodide in, vi. 29
    stovaine in, viii. 398
  acute, **salvarsan** in, iv. 210
  chronic, **mercury cyanide** in, vi. 683
  gonorrheal, **bacterial vaccines** in, ii. 420
    gonococcus vaccine in, ii. 360

Reber and Lawrence (Ophthal. Rec., Jan., 1915) have recorded 3 cases of iritis in which the complement-fixation test established an old latent gonococcemia, which yielded promptly to **bacterin** treatment. Gonorrheal iritis is more frequent than rheumatic.

  plastic, **scopolamine** in, viii. 104
  purulent, vi. 67
    acetanilid in, vi. 68
    bleeding in, vi. 68
    corneal incision in, vi. 68
    enucleation in, vi. 68
    morphine in, vi. 68
    poultice in, vi. 68
  quiet, vi. 62
  rheumatic, **aconite** in, i. 284

In a case of recurring rheumatic iritis refractory to antirheumatic remedies and local applications, M. F. de la Cruz (Revista de med. y cir. Pract., Jan. 7, 1916) observed the condition to yield readily and permanently to internal use of **aconitine**.

    scopolamine in, viii. 104
    streptococcus vaccine in, ii. 346

Iritis (*continued*).
  syphilitic, **atropine** in, ii. 445
    scopolamine in, viii. 104
  traumatic, **pilocarpus extract** in, vii. 472
Iritic adhesions, **physostigmine** in, vii. 460
Iron (ferrum), vi. 69
  poisoning by, vi. 83
  waters, vi. 711
Irreducible hernia, v. 457
Irritability, cystic, **cubeb** in, iii. 711
  renal, **lupulin** in, vi. 467
Irritable heart, **cactus grandiflorus** in, ii. 708
Italian method of rhinoplasty, see Surgical Anaplasty, viii, 433, 442
Irritative cough, **anhalonium Lewinii** in, i. 700
Ischemia of nerves, vi. 787
Ischemic muscular contracture, vi. 767
Ischiatic hernia, v. 496
Ischiorectal abscess, see Periproctitis, vii. 772
Ischium, fractures of, iv. 779
Itching, see Pruritus, vii. 649
Ivy poisoning, see Dermatitis Venenata, iii. 792; also this Index.

Jaborandi, vii. 463
Jackson's bronchoscope, vi. 246, 247, 251
  esophagoscope, vi. 257
  insufflation tubes, vi. 255
  laryngeal speculum, vi. 243, 244, 247, 255
  pectoral syrup, vii. 175
Jacksonian epilepsy, see Epilepsy, iv. 528; also this Index.
Jacob's ulcer of the eyelids, see Eyelids, Carcinoma of, iv. 723
Jaffé's test for indican, v. 647, 649
Jail fever, see Typhus Fever, viii. 665
Jalap, vi. 90
  poisoning by, vi. 90
Jambul, vi. 91
Jamestown weed, see Stramonium, viii. 406
Japanese river fever (shima mushi), vi. 92
    iodine ointment locally in, vi. 92
    personal cleanliness in, vi. 92
    quinine hydrochloride in, vi. 92
    sodium salicylate in, vi. 92
Jaquet's sphygmocardiograph, v. 314, 315
Jaundice, vi. 378

Two cases of splenomegalic hemolytic icterus greatly improved, if not cured, by **splenectomy** are reported by G. E. Brewer (Med. Rec., July 1, 1916). Early splenectomy is comparatively safe.

In a young man with splenomegalic icterus, after a year of futile medication, Jona (Il Policlinico, Jan., 1916) gave 21 **X-ray** treatments over the spleen, which definitely arrested the process, the patient having remained well almost 3 years. One should try the rays before resorting to splenectomy.

  blood transfusion in, viii. 805
  stillingia in, viii. 324
acute infectious, vi. 395
  calomel in, vi. 396, 678
  cascara in, vi. 396
  diet in, vi. 397
  enemata in, vi. 396
  mercury with chalk in, vi. 396
  salicylates in, vi. 396
  salines in, vi. 396
camp (trench), see also Spirochetal Jaundice, below.

Schwarzwald (Wiener klin. Woch., Dec. 21, 1916) terms *Frontikterus* a mild transient jaundice occurring almost exclusively in men in the trenches. In 7 of 50 cases there was a history of severe fright from a shell explosion.

Organisms resembling the paratyphoids were discovered by Sarrailhé and Clunet (Lancet, Mar. 25, 1916) in cases of camp jaundice and in others with febrile gastric derangement during an epidemic of jaundice.

In the European war, jaundice has occurred among the troops on almost all fronts. According to W. H. Willcox (Brit. Med. Jour., Feb. 26, 1916), it is hepatogenous jaundice, and seems to start as a gastrointestinal infection. In the treatment he recommends the following mixture in ounce (30 c.c.) doses 3 times a day:—

℞ *Sodii bicarbonatis.* ʒiij (12 Gm.).
Potassii citratis,
Sodii sulphatis .āā ʒiv (16 Gm.).
Syrupi aurantii .. ℥j (30 c.c.).
Aquæ, ...q. s. ad ℥viij (240 c.c.).
M. ft. mist.

Ten-grain (0.6 Gm.) doses of **hexamethylenamine**, 3 times a day, seemed effective as intestinal antiseptic. The diet should be light, and

contain fresh fruits or yeast to provide vitamines.

catarrhal, Bier's hyperemia in, v. 595
  calomel in, vi. 678
  nux vomica in, vii. 149
  pilocarpine in, vii. 470
  podophyllum in, vii. 567
  rhubarb in, viii. 30, 186
  silver nitrate in, viii. 135
  sodium bicarbonate in, viii. 186
  taraxacum in, viii. 503
extrahepatic, see Jaundice, Obstructive, vi. 379
hemohepatogenous, see Jaundice, Toxemic, vi. 388
hemolytic, see Jaundice, Toxemic, vi. 388
hepatogenous, see Jaundice, Obstructive, vi. 379
malarial, nitrohydrochloric acid in, vii. 46
malignant, see Liver, Acute Yellow Atrophy, vi. 397
non-obstructive, see Jaundice, Toxemic, vi. 388
obstructive, vi. 379
  alcohol lotions in, vi. 388
  alkaline baths in, vi. 387
  benzonaphthol in, vi. 388
  bile opotherapy in, i. 798; vi. 388
  bismuth compounds in. vi. 387, 388
  calcium chloride in, vi. 386, 388
  calomel in, vi. 386, 388, 678
  charcoal in, vi. 387
  chloral hydrate in, vi. 387
  chloroform in, vi. 388
  cholecystenterostomy in, vi. 385
  cholecystotomy in, vi. 385
  choledochotomy in, vi. 386
  coal tar in, vi. 387
  cold enemata in, vi. 387, 388
  diet in, vi. 385-387
  electricity in, vi. 388
  emetine hydrochloride in, vi. 60
  exploratory incision in, vi. 386

Studying the hemorrhagic tendency in obstructive jaundice, with special reference to its pre- or post-operative treatment, F. W. Aves (Texas State Jour of Med., Feb., 1917) found gelatin hypodermatically the most rapidly and uniformly acting coagulant. Sera and whole blood proved useless in these cases. Calcium salts by mouth are effective after 10 to 14 days, and should be given for days preceding operation.

  glycerin in, vi. 388
  hexamethylenamine in, vi. 386, 388
  hot lotions in, vi. 388
  kefir in, vi. 388
  liver extract in, vi. 388
  magnesium citrate in, vi. 386
  magnesium sulphate in, vi. 386
  menthol in, vi. 388
  mercury bichloride in, vi. 388
  mineral aperient waters in, vi. 386-388
  nux vomica in, vi. 387
  olive oil in, vii. 170
  phenol in, vi. 387, 388
  resorcinol in, vi. 388
  rest in bed in, vi. 385-387
  rhubarb in, vi. 387; viii. 30
  salacetol in, vi. 388
  saline aperients in, vi. 386, 387
  saline solution in, vi. 387
  short-circuiting operation in, vi. 385
  sodium benzoate in, vi. 387
  sodium bicarbonate in, vi. 387, 388
  sodium phosphate in, vi. 338; vii. 450
  sodium salicylate in, vi. 386-388
  sodium sulphate in, vi. 388
  starch in, vi. 388
  static current in, vi. 388
  surgical measures in, vi. 385, 386

According to Erdmann and Heyd (Amer. Jour. Med. Sci., Aug., 1916), all cases of chronic obstructive jaundice are entitled to operative consideration. Some are thus cured because there has been a mistake in the diagnosis. The relief from itching, besides the prolongation of life, strongly favors operation, which also obviates pressure-pain from distention of the biliary apparatus. The operations thus advised as palliative procedures comprise various forms of anastomosis of the gall-bladder, hepatic duct, or common duct with the stomach, duodenum, small intestine, or colon, according to indications.

  vinegar lotion in, vi. 388
  warm alkaline drinks, vi. 387
  warm baths in, vi. 387
  water, copious use in, vi. 388
  yoghurt in, vi. 388
  zinc oxide in, vi. 388

Jaundice (*continued*).

of polychroma, see Jaundice, Toxemic, vi. 388; also this Index.

pruritus of, **phenol lotion** in, vii. 443

pilocarpine in, vii. 471

spirochetal, acute.

Icterohemorrhagic spirochetosis (acute infectious jaundice; hemorrhagic jaundice; trench jaundice; so-called "Weil's disease").—An "icteroid typhoid" exactly similar to the recently studied spirochetal jaundice was describd by Larrey in Napoleon's day, according to L. Martin and A. Pettit (Bull. de l'Acad. de méd., Oct. 10, 1916), and infectious jaundice of typhoid type was studied in 1882 by Landouzy and Lancereaux, and by others in France before these.

Symptoms.—In the disease as observed among troops, Trembur and Schallert (Med. Klinik, Apr. 16, 1916) note that the diagnosis can usually be made from the symptoms before jaundice appears. The prodromes, lasting 2 to 4 or more days, comprise severe frontal headache, lumbar pain, and marked pain and heaviness in the limbs, sometimes extending to the chest and neck muscles, and with pronounced tenderness of muscles. There may also be vomiting, epistaxis, slight mucoid diarrhea, conjunctivitis, pharyngitis, vertigo, and severe malaise. The temperature usually shows 1 or more recrudescences. There is generally a purulent bronchitis and catarrhal inflammation of the mouth and pharynx, with frequent dysphagia and vomiting. The liver is enlarged and tender. Diarrhea is common at first, the stools soon becoming clay-colored, with constipation later. There is usually circulatory depression. Albumin with granular and hyaline casts are ordinarily found. There is a variable degree of jaundice. The prognosis is good.

Etiology.—Inada, Ido, Hoki, Ito, and Wani (Jour. of Exp. Med., Mar., 1916) note that in the latter part of 1914 they demonstrated a spirochete in the blood of patients with infectious jaundice, which they held to be its cause, and termed *Spirochæta icterohemorrhagica.* Although infection is generally believed to take place through the alimentary tract, they show that the organism can penetrate the normal skin. Hübener and Reiter (Deut. med. Woch., Jan. 6, 1916) name the organism *Spirochæta nodosa,* and note that upon injection in guinea-pigs it produces an analogous disease. A. Stokes, Ryle and Tytler (Lancet, Jan. 27, 1917) point out that studies as to the mode of transmission of the disease, which is most prevalent in wet trenches, and uncommon among civilians, is by field rats, in the kidneys of which the spirochetes have been frequently discovered. Noguchi (Jour. of Exper. Med., May, 1917) showed that wild rats captured in the United States carry in their kidneys a spirochete apparently identical with the *S. icterohemorrhagica.* According to Wilmaers and Renaux (Arch. méd. belges, Feb., 1917) clinical differences exist between the spirochetal hemorrhagic jaundice and true Weil's disease, no one as yet having been able to cultivate from the latter cases a similar spirochete.

Diagnosis.—The best test confirmatory of the clinical diagnosis of spirochetal jaundice is, according to Martin and Pettit (Presse méd., Dec. 14, 1916), in cases not too far advanced, an injection of the patient's blood and urine into the peritoneum of a guinea-pig, which will succumb in four to eight or more days with icterohemorrhagic symptoms, adynamia, and edema. In later cases, the complement deviation reaction and the reaction of neutralization—the latter instituted by mixing the patient's serum with an otherwise rapidly fatal dose of the virus and injecting it into a guinea-pig—are available as tests. Garnier and Reilly (Paris méd., Mar. 3, 1917) state that the spirochetes can easily be detected in the urine by mixing the centrifuge sediment with India ink.

Treatment.—Serum from convalescents or immunized horses has given

best results. Inada and his co-workers (Correspondenzbl. f. schweiz. Aerzte, Jan. 20, 1917) found in 35 cases—half of them severe—that their immune horse serum, 0.01 c.c. of which protects a guinea-pig against 1 c.c. of a pure culture (10 spirochetes in 1 microscopic field) simultaneously injected into the peritoneum, would destroy the spirochetes in the blood in 5 to 24 hours. The dose of the serum was 40 or 60 c.c. The mortality in their cases was 11.4 per cent., while the previous average in the clinic had been 30.6 per cent., and the mortality elsewhere in Japan 40 to 48 per cent. (The death rate in Europe has been lower—6 per cent., according to Stokes, Ryle, and Tytler). Bonnini (Gazz. d. Osped. e. d. Clin., Mar. 4, 1917) has used serum from immunized goats with success, but found arsenicals and mercurials of no avail. **Sodium bicarbonate** or **sulphate** solutions were of service, and a **milk diet** is advised at the outset, with **greens** and vegetable purées added later. Martin and Pettit (*loc. cit.*) lay stress on **washing** of the **mouth** and **colon irrigations**, together with **hot baths** and **adrenalin**, while Trembur and Schallert (*loc. cit.*) employ **saline hypodermoclysis** to promote diuresis, and Stokes, Ryle, and Tytler (*loc. cit.*) **plenty of fluids, fruit** to eat, and **rectal use of glucose**—1 pint (500 c.c.) of a 6 per cent. solution—once or twice daily in cases with vomiting and acetonuria.

toxemic, vi. 388
  antisyphilitic treatment in, vi. 390
  arsenic in, vi. 393
  calcium chloride in, vi. 393
  cholesterin in, vi. 393
  human blood (defibrinated) in, vi. 394
  iron in, vi. 393
  mercury salicylate in, vi. 390
  nourishing food in, vi. 394
  organotherapy in, vi. 393
  prevention of hemolysis in, vi. 393
  remove cause in, vi. 393
  rest in, vi. 394
  serum injections in, vi. 394

Jaundice, toxemic (*continued*).
  splenectomy in, vi. 393, 394
  X-rays in, vi. 393, 394
 toxic.

Many cases of jaundice among munition workers, due to trinitrotoluol, have been reported since the beginning of the European war. Tetrachlorethane has also at times caused jaundice. The skin is believed the main channel of absorption of these poisons. According to M. J. Stewart (Brit. Med. Jour., Feb. 3, 1917) the associated liver lesion lies somewhere between subacute yellow atrophy and ordinary multilobular cirrhosis of irregular distribution. Dermatitis, gastritis, and blood changes typically accompany the toxic jaundice. W. J. O'Donovan (*ibid.*) states that the jaundice may supervene from the fourth day to the ninth month of munition work, and may first appear after a period of freedom from exposure extending as long as 2 months. The prognosis is uncertain, coma or convulsions suddenly setting in sometimes when recovery was expected. According to W. R. Smith (*ibid.*) constipation is an almost invariable symptom. **Absolute rest in bed** is essential even in the mildest cases, and where there is a tendency to hemorrhage **calcium chloride** may be used.

Jaw, diseases of, vi. 729
 dislocation of, iv. 306
 fistula of, **cocaine anesthesia** in, iii. 493
 fractures of, iv. 762
 necrosis of, vi. 730
 phosphorus necrosis of, vi. 730
  antiseptic washes in, vi. 730
  carious teeth extracted in, vi. 731
  cavity packed in, vi. 732
  easily digested foods in, vi. 731
  iodoform gauze in, vi. 732
  lime-water in, vi. 731
  magnesia in, vi. 731
  potassium permanganate in, vi. 731
  ramus removed in, vi. 732
  sequestra removed in, vi. 732
  tartar removed in, vi. 731
  tonics in, vi. 731
  turpentine in, vi. 731

Jaw, phosphorus necrosis of (*continued*).
    prophylaxis in, vi. 732
        absolute cleanliness of mouth and hands in, vi. 732
        free ventilation in, vi. 732
        turpentine in work-rooms in, vi. 732
  resections of, vii. 789, 790
  tumors of.

According to C. W. Bonney (Amer. Jour. Surg., xxx, 17, 1916), an early diagnosis of malignant disease of the jaw is not made as often as in some other parts. The diagnosis is simplified in that neoplasms occur on the epithelial surfaces, and do not heal kindly after the source of irritation has been removed. In a series of 36 cases, all but 1 in men, the primary operation was undertaken in 10 with good results. Preliminary ligation of the external carotid was done without harm.

  war injuries of.

According to J. L. Payne (Proc. Roy. Soc. Med. ix, Odontol. Sect., 63, 1916), external appliances seldom avail to correct deformity due to jaw injuries in war practice. He divides the treatment into (1) reduction of bony displacements; (2) retention of fragments to allow normal occlusion; (3) reduction of cicatricial contraction, restoration of muscular equilibrium by frequent massage, manual and electrical, and remoulding of the facial contour; (4) fitting of a permanent prosthetic appliance. The idea that an interdental splint, at an early stage, tends to promote sepsis is erroneous. Hotz (*ibid.*) favors simple rubber splints in most cases, and, if necessary, linen bandages or special chin-cups of rubber or metal. A good method for the hygiene of oral wounds is to suspend a receptacle, with tube and glass cannula, above the head; fill it with tepid solution of **iodine** or **sodium chloride**, and wash out the cavity 3 to 6 times a day. Colyer (*ibid.*) emphasizes the need of removing the septic roots as well as the teeth on either side of the fracture. In fractures in the region of the last molar tooth, he uses a "skull and mandible splint," consisting of a metallic splint moulded to the outside of the mandible in a knitted skull-cap. Scar tissue is cut away freely from the jaw, and forcible stretching of the soft tissue with plugs of vulcanite is carried out. Sir Frederick Eve (*ibid.*) holds the ideal method of bridging over gaps in the mandible to be **bone transplantation**, *e.g.*, a portion of the eleventh rib. This is facilitated if splints are firmly cemented to the teeth across the gap. According to Mummery (*ibid.*), in losses of bone extending ½ to ¾ inch, osseous union will usually take place without wiring, of which he disapproves. Carter (*ibid.*), however, believes in suturing the jaw with silver-plated copper wire, this being followed quickly by osseous union.

Jejunitis, see Intestinal Catarrh, v. 706; also this Index.
Jejunostomy, i. 73
    Eiselsberg-Witzel technique in, v. 554
Jejunum, ulcer of.

Only 3 cases of primary ulcer of the jejunum following gastroenterostomy could be found in the literature by R. C. Bryan (Surg., Gynec. and Obstet., Mar., 1916), his own case making a fourth. After gastroenterostomy, the lower the point of anastomosis in the jejunum the more susceptible the mucosa apparently to the peptic juices. An ulcer may develop rapidly and perforate shortly after operation, or in a few weeks after operation, suggesting a recurrence, or very slowly. Predisposing factors are rough handling at the operation, unabsorbable sutures, or sepsis. The necrosed area is located opposite the stoma. Gastroenterostomy causing jejunal ulceration, one should hesitate to perform it for primary ulcer of the jejunum, but should resort instead to **excision**, **resection** or **enterostomy**.

Jenner's staining fluid, v. 379
Jequiritol (Roemer), vi. 94
Jequirity, vi. 92

Jequirity (*continued*).
  poisoning by, vi. 93
Jigger (sand flea; dermatophiliasis), see Wounds, Venomous, this Index.
Jimson lily (weed), see Stramonium, viii. 406
Joachim and Weiss phonoscope, v. 326
Johnson's test for albumin, i. 502
Joint mice, vi. 144
Joints, diseases of, vi. 95
  gouty, v. 75; vi. 120
    collodion in, iii. 536
    iodine glycerole in, vi. 7
  gunshot injuries of.

Bullet wounds of joints, according to Schwartz and Mocquot (Rev. de Chir., Apr., 1916), usually behave as aseptic wounds, but wounds by irregular missiles, shells, bombs, and grenades, are often complicated by infection. In all such wounds, even if benign in appearance, the **projectile should be removed at once.** In simple penetrating wounds without osseous injury an **arthrotomy** is made, followed by **drainage,** though sometimes without an actual drain. After 36 hours the opening closes spontaneously. Simple fissure injuries are similarly treated. When joint surfaces are severely damaged, partial or total **resection** is done, typically or atypically, according to the case. An attempt is made to preserve the periosteum. Rigorous asepsis is absolutely essential as in civil practice, and the **thermocautery** may be necessary to obtain a relative asepsis. For the lower limb spinal injection of **novocaine** is sufficient. After intervention the joint is **immobilized.**

In joint wounds with injuries of the soft parts only, Haller (Bull. et mém. Soc. de chir. de Paris, xlii, 1404, 1916), after **disinfecting the orifice,** uses **immobilization** and **compression.** In joint reactions in the presence of diaphyseal or diaphyso-epiphyseal fractures, with fissure into the joint, an early **partial resection** may be necessary, though sometimes avoidable by a minute **clearance of débris** and wide **drainage** at first. Where there is breakage of bony joint surfaces he advises an economical **resection.** In large disruptions he **amputates** at once. Secondary amputation proved necessary 6 times in 55 cases of arthrotomy or resection; 4 recovered and 2 died. Among 19 immediate amputations 12 recovered and 7 died.

Applying from Sept., 1915, to July, 1916, **Carrel's method,** after wide opening up of the injured knee-joint, Depage (Bull. et mém. Soc. de chir., xlii, 2722, 1916) observed among 26 relatively mild wounds, 15 recoveries with complete function, 2 with ankylosis without suppuration, and 9 suppurations; of the latter, 2 recovered after **arthrotomy** and **resection;** 4 after arthrotomy, resection, and **amputations,** and 1 died of gas septicemia. In 6 very severe wounds 3 recovered without suppuration, and 3 after resection on admission.

After July, 1916, he systematically performed **immediate closure of the joint** in spite of extensive bony lesion, having **excised** all **injured tissues, irrigated with Dakin's solution** or **ether,** and **curetted** out crushed bone parts, a small **drain** being left in the joint for 24 hours. The **limb** was then **immobilized,** with **massage** and **passive movements** after 8 to 10 days. Of 20 cases thus treated, 19 recovered with extensive motion, and only 1 required resection after some days, with recovery. Both these treatments gave results vastly superior to those from previous methods.

Burckhardt and Landois (Beitr. z. klin. Chir., xcviii, 358, 1916) found that **resection** of the hand-, foot,- and elbow- joints gives good results in infection due to war injuries. In the knee-joint, resection is indicated if the general state is good and there is only moderate bone destruction, though pseudoarthrosis usually results. In the shoulder-joints results are better, but in infected hip-joints resection rarely saves the patient's life. In 1810 joint resections Nové-Josserand and Tuffier (Bull. de l'Acad. de méd., May 16, 1916) noted a mortality of 5 per cent. in the upper extremity and 27 per cent. in the lower.

According to R. Leriche (Jour. de chir., xiii, 350, 1915), wounds of the elbow-joint, even if seemingly slight, are almost always infected, and **primary resection** is preferable in the long run to the so-called conservative treatment. Ankylosis or flail-joint after resection is due merely to defective after-treatment. Excessive massage and movements are to be avoided. Of 9 primary resections followed for several months, none developed reankylosis or flail-joint. **Subperiosteal denudation of the muscles** to preserve their normal attachments is advised. The classical method of resection should be followed, giving better results than partial resections. The wound should not be sutured, but the arm dressed at an acute angle, and placed in a **wire trough.** The results of direct **heliotherapy** after the fourth or fifth day are remarkable. As soon as pain stops **passive movments** are begun. After 2 or 3 weeks the wire splint is removed and the arm put in a sling, and **active movements** are soon after encouraged.

In cases of inflammatory exudates in joints Krotkina (Russky Vratch, xv, No. 17, 1916) recommends **Bier's hyperemia** treatment, followed if necessary by joint **juncture.** There is benefit even in pyemic states, provided the process is confined to the joint. If cellulitis sets in, it must be preceded by large incisions. If continuous, persistent Bier treatment does not prevent or arrest suppuration, **partial excision** is indicated, or in malignant edema, early **amputation.**

Sehrt (Münch. med. Woch., Mar. 7, 1916), in using the **Bier band,** leaves it on indefinitely. Where it can be applied in 24 to 60 hours, infection is reduced, or even entirely aborted. The elastic band is applied no tighter than a plaster bandage. The limb swells below it, and may even blister, but the wound is left practically undisturbed, merely covered with gauze, and the limb fastened loosely on a splint. Pain is promptly arrested. By the fourth to the tenth day, the patient makes movements inside the loose dressing. The only surgical procedure used is incision, under local anesthesia, of a gravity abscess, if such develops. If the treatment proves insufficient, any operation indicated is performed.

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  iodine glycerole in, vi. 7
stiffened, **hot compresses** in, viii. 814

Immobilization of an injured joint is deprecated by Collie (Lancet, Aug. 5, 1916), inevitably leading to adhesions. When these are to be broken down, a general anesthetic should be

given, but not nitrous oxide, which does not give sufficient muscular relaxation. Passive movements should be begun a few hours after the operation, and meantime the muscles skillfully massaged. The joint must never be bandaged or splinted.

surgical diseases of, vi. 95, 151

In infected joints, S. M. Cone (Amer. Jour. of Orthop. Surg., Jan., 1915) injects 5 per cent. **phenol** (pure, when adhesions are desired), followed by **alcohol**. The best results were in joints infected by the gonococcus, staphylococcus, streptococcus, and tubercle bacillus.

According to F. J. Cotton (Boston Med. and Surg. Jour., June 1, 1916), closed joints are highly resistant to septic infection. In all septic joints he lays the joint wide open, irrigates for 15 minutes with **corrosive sublimate** (1:15,000), followed by cleansing with **salt solution,** after which the capsule is tightly **sutured** and the external **wound left wide open,** or nearly so. Where the capsule has been already destroyed closure of the joint is not recommended.

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Kader's operation for gastrostomy, i. 46
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The superficial lesions caused by the leishmania are classed by Almenara (Cronica medica, Dec., 1916) as ulcerative or tubercular, the latter subject to ulceration and crust production.

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Tartar emetic has been found by Leonard Rogers (Lancet, Nov. 4, 1916) a specific in kala-azar. He uses a 2 per cent. solution, injected intravenously. Of 18 cases, 3 were cured, 2 greatly improved, 2 improved, and 1 died of tuberculosis after the parasites had disappeared. Doses of 8 to 10 c.c. (2 to 2½ drams) every 3 days gave best results, usually starting with 4 c.c. (1 dram). Treatment was continued several weeks after fever had disappeared.

infantile, see Ponos, vii. 567
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While the **X-rays** and **radium** are the procedures of choice in keloids, according to Gaucher (Bull. et mém. de la Soc. méd. des hôp. de Paris, Nov. 23, 1916), the **Finsen rays** will yield the same therapeutical result without the risk of late ulcerative dermatitis.

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  liquor potassæ in, viii. 169
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  hot fomentations in, iii. 659
  hot water in, iii. 661
  hyoscine hydrobromide in, iii. 650
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Iodine hypodermically is recommended by R. Kerry (Ophthalmol., xii, 327, 1916) in keratitis, scleritis, and uveitis. He gives 10 minims (0.6 c.c.) of a 2.5 per cent. solution, in fatty combination, in the flank once or twice weekly.

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According to S. Theobald (N. Y. Med. Jour., Aug. 5, 1916), the primary lesion in simple herpetic keratitis is situated in the ciliary ganglion. The most useful local remedies are holocaine and atropine; often 1, sometimes both, are supplemented by dionin instillations. Recovery is somewhat tedious.

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  hexamethylenamine in, v. 532
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  yellow oxide ointment in, iii. 651
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In acute coryza and gastro-intestinal disturbances, herpetic lesions at the periphery of the cornea may occur, states F. H. Verhoeff (Arch. Ophth., xlv, 148, 1916). Facial herpes being neuropathic, these lesions are

probably likewise so. Rosacea keratitis is also regarded by him as a neuropathic keratitis. He does a partial periotomy to interrupt the injurious nerve impulses. In 15 cases he uniformly secured prompt healing, without recurrence.
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  holocaine in, iii. 649
  hyoscine hydrobromide in, iii. 650
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  congestion of, see Kidneys, Hyperemia, vi. 176; also this Index.
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Experiences with polycystic kidney at the Mayo clinic are reported by Braasch (Surg., Gynec. and Obstet., Dec., 1916). Of 41 cases, it was pre-operatively diagnosed in 26. The chief symptoms were moderate pain, hematuria, tumor, and diminished renal function. Hematuria occurred in 40 per cent. In but half was a bilateral tumor noted. The phthalein test, for differential estimation of the 2 kidneys, is important in determining upon operation. In 14 cases **nephrectomy** was done with 1 post-operative and 1 subsequent death. The **Rovsing operation** (multiple puncture of cysts) was done in 10 patients, with 2 post-operative and 1 later death. When there is marked toxemia, or the blood-pressure is 200 or more, or the functional tests are unfavorable, any operation is dangerous. When there is moderate renal insufficiency the Rovsing operation is beneficial. Nephrectomy is indicated only for widespread infection, persistent hematuria, or destruction of renal tissue from mechanical obstruction, lithiasis, or other complication.

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  diagnostic measures in surgical diseases of, vi. 203
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In pyelo-ureterography, H. W. E. Walther (N. O. Med. and Surg. Jour., lxix, 115, 1916) injects preferably thorium nitrate in 10 or 15 per cent. solution, into the renal pelvis with a gravity apparatus. With the patient standing one may get an idea of renal mobility and other abnormalities which would not show in a reclining position. In nephroptosis, especially in the obese, pyelo-ureterography is the only means of making a diagnosis. Renal and ureteral anomalies and hydronephroses can be easily outlined, and abdominal tumors differentiated from those of the kidney.

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The uremic coefficient of Ambard —*Ambard's constant* or quotient—expresses the ratio between the urea in the blood and the square root of the urea excreted in the urine. According to the laws formulated by Ambard, the rate of urea output varies directly as the square of the concentration of urea in the blood, and inversely as the square root of that in the urine. In the formula used for calculating the coefficient in the individual case, the necessary data comprise the number of grams of urea per liter of blood and of urine, the output of urea in twenty-four hours, and the patient's weight. The normal constant is 0.06 to 0.09; with decreasing renal efficiency it rises. An extensive discussion of Ambard's constant is given by F. McLean (Jour. of Exp. Med., xxii, 212, 1915).

According to Jonas and Austin (Amer. Jour. Med. Sci., Oct., 1916), the Ambard formula in its original form, or as modified by McLean, does not express precisely the law of renal function as regards urea. Using McLean's modification clinically, they conclude that the index affords no diagnostic or prognostic information that cannot as readily be deduced from the blood urea alone, and they prefer the latter test.

D. S. Lewis (Arch. of Internal Med., Jan., 1917), on the other hand, finds that under routine conditions Ambard's laws are remarkably accurate. The coefficient is absolutely independent of the blood urea concentration and is governed by the condition of renal function. The coefficient is depressed in fever, hyperthyroidism, hypertension with early changes in the renal arterioles, and in early chronic diffuse nephritis. The depression is an evidence of increased renal activity due to irritation. It is raised in myxedema, myocardial insufficiency, and nephritis with renal insufficiency, more in chronic diffuse nephritis than in the vascular type. For accurate prognosis repeated determinations of the coefficient are of great importance.

According to F. C. McLean (Jour. Amer. Med. Assoc., Feb. 5, 1916), the value of determination of blood-urea is lessened by its great variability even normally. Ambard recognizing this, advocated the determination of the relationship between the blood urea concentration and its rate of elimination. The writer presents a formula utilizing the several factors on which Ambard bases his conclusions, viz., urea excretion per diem, urea per liter of urine, urea per liter of blood, and body weight. The resultant index of excretion closely parallels the phenolsulphonephthalein coefficient, but seems more sensitive.

[Ambard's constant is one of the most important tests contributed recently, and is entitled to careful study. C. E. de M. S.]

Estimation of the *creatinin* of the blood in nephritis is deemed valuable by Myers and Lough (Arch. of Internal Med., Oct., 1915) as a diagnostic and prognostic test. They use a modified Folin method, oxalated and laked blood being saturated with picric acid, filtered, treated with sodium hydroxide, and then compared colorimetrically with a standard creatinin solution, to which the alkali has also been added. A rise above 2.5 mg. in 100 c.c. of blood signifies renal involvement almost invariably; values of 2.5 to 3 mg. are suspicious, of 3 to 5 mg. decidedly unfavorable, and over 5 mg. probably indicate early death. Pronounced retardation of creatinin excretion may indicate interruption of pregnancy.

cryoscopy, vi. 203
indigo-carmine in, vi. 203

Wechselmann (Berl. klin. Woch., Jan. 24, 1916), after using an intravenous injection of *lactose* in many thousands of cases, maintains its value as an index of the glomerular function. To avoid the by-effects traced to contamination of the lactose with molds, he has the latter prepared under sterile conditions and immediately dissolved in freshly distilled water.

methylene blue in, vi. 203

The *non-protein* (rest, retention, or incoagulable) *nitrogen* of the blood comprises all the nitrogenous substances remaining after precipitation of the proteins by, *e.g.*,—in Folin's method—methyl alcohol and later zinc chloride. With Folin's procedures, 2 to 5 c.c. of blood is sufficient for the estimation. The proteins, having been removed, the total non-protein nitrogen is estimated by what is essentially a Kjeldahl procedure in diminutive form. Normally, the amount, according to Tileston and Comfort (Arch. of Int. Med., Nov., 1914) is below 30 mg. per 100 c.c. of blood. A rise to between 35 and 50 mg. is a considerable increase and above 100 mg. the condition is very dangerous.

Scheel (Ugeskrift f. Laeger, Apr. 13, 1916) considers determination of the non-protein nitrogen even more important than examination of the urine for albumin. It differentiates nephritis from conditions with cardiac hypertrophy and high pressure, and shows to which nephritics one can permit protein freely and which must have their protein cut down. In 12 cases of uremia the residual nitrogen was over 100, up to 289. Hydremia may mask the nitrogen retention, and has to be taken into account in the milder cases. He recommends Bang's method, in which blood or serum is dropped on paper, and a precipitating fluid such as phosphomylobdic acid, applied.

phenolsulphonephthalein in, vi. 203
phloridzin in, vi. 203

According to Krotoszyner and Stevens (Trans. Amer. Med. Assoc.; N. Y. Med. Jour., June 23, 1917), as a test for comparative renal function the intravenous *phloridzin* test—0.01 to 0.02 Gm. in a special tablet—gives more accurate and reliable results and is less time-consuming than the phthalein test.

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The *test-meal* method of investigating renal function has been especially investigated by Mosenthal (Arch. of Internal Med., xvi, 733, 1915). The diet ordered contains about 13.4 Gm. of nitrogen, 8.5 Gm. of salt, 1760 c.c. of fluid, and considerable purins in meat, soup, tea, and coffee. All these act as diuretics, and the mode of excretory response is watched. In private practice it is only necessary to be certain that the diet contains enough of the ordinary diuretic materials. The urine is collected punctually every 2 hours, and the specific gravity, salt, nitrogen, and water excretion noted. When kidney function becomes impaired, the quantity of night urine first becomes increased, while the specific gravity and nitrogen concentration are lowered. In severe chronic nephritis, there is a fixed, low specific gravity, diminished output of salt and nitrogen, and a tendency to total polyuria. Such functional pictures are also found regularly in pyelitis, cystitis, hypertrophied prostate, marked anemia, pyelonephritis, polycystic kidney, and diabetes insipidus. Prognosis and therapy depend largely on the cause.

Pirondini (Policlinico, July, Surg. Sect., 1915) recommends tracing the elimination of *urea* in the urine after drinking rapidly 300 c.c. of distilled water containing 10 Gm. of urea. The bladder is first emptied, and the subject lies down for half an hour; the bladder is then emptied anew with the catheter and the dose taken, after which the urine is examined at half-hour intervals for over 2 hours.

In testing kidney functioning, Treupel (Deut. med. Woch., Feb. 10, 1916) proceeds thus: After a standard diet for a time, 1600 c.c. of *water* are ingested; the normal subject eliminates this in 12 hours. Next, 0.5 Gm. of *potassium iodide* by mouth, should be eliminated normally in 50 or 60 hours. A test dose of *sodium chloride,* 10 Gm., is then given, and recovered from the urine by Strauss's method. The test dose of *lactose* is 20 c.c. of a 10 per cent. solution, injected intravenously, normally eliminated at latest in 6 hours, and examined for with the polarimeter. The tubules are probably at fault when the potassium iodide elimination is prolonged.

In a comparative study of the various tests H. O. Mosenthal and D. S. Lewis (Jour. Amer. Med. Assoc., Spt. 23, 1916) found that the earliest indication for renal impairment is given by the test meal—specific gravity test; next comes the phenolsulphonephthalein test, then Ambard's coefficient, and finally the blood urea. Owing to the external lethal factors in nephritis, the relative prognostic value of the tests is uncertain, but non-protein blood nitrogen over 90 mgm. or a blood urea nitrogen above 65 mgm. seems the most trustworthy sign of fatal outcome. An Ambard coefficient of 0.2 or higher also means a fatal ending in a few months. In cases with marked anemia there was often a dissociation of renal function, showing that each test covers only a limited range of renal activity.

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The opaque ureteral catheter is used by A. Fullerton (Brit. Jour. Surg., iv, 278, 1916) in determining whether a missile is within the kidney or situated outside it. If actually in the kidney, it should be removed. The opaque catheter, with stereoscopic radiography, gives excellent diagnostic results.

    surgical measures in, i. 126

[W. W. Babcock urged 5 years ago that after crushing injuries of renal substance spontaneous repair is usual. Operation should not be undertaken unless there is evidence of intraperitoneal leakage, progressive hemorrhage, urinary extravasation, or sepsis. C. E. de M. S.]

In a case reported by Picquet (Bull. et mém. Soc. de chir. de Paris, xlii, 2923, 1916) a missile had traversed the kidney; the patient showed signs of internal hemorrhages, but without peritoneal reaction. He was treated expectantly for 8 days. On the appearance of signs of secondary hemorrhages the writer operated, and found about the level of the inferior pole of the kidney a dense mass resembling a tumor, which was resected. Recovery followed. The hematuria is held to have resulted from an infarct. Such hematurias are usually controlled only by a total nephrectomy.

  irritation of, lupulin in, vi. 467
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An operation is recommended by Willard Bartlett (Trans. Amer. Med. Assoc.; N. Y. Med. Jour., June 16, 1917) in which the fat is stripped from the inside of the lumbar muscles, the fatty renal capsule stripped off except at its attachment around the hilum, and completely inverted as the kidney is lifted out of the wound. This fat is then transformed into a ball by catgut sutures, and the ball drawn down into the defect into which the kidney formerly slid, and anchored just below the incision, which bisects the angle between the last rib and erector spinæ. In 20 cases the kidney always remained in place as late as 5 years after this operation.

    nephrorrhaphy in, vi. 209
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  primary or genuine contracted, see Nephritis, Chronic Non-exudative, ii. 620; also this Index.
  red granular, see Nephritis, Chronic Non-exudative, ii. 620; also this Index.
  rupture of.

Thomas (Journal-Lancet, Feb. 1, 1917) has seen many cases with acute

renal pain after heavy lifting, etc., sometimes followed by tumor-formation or hematuria, or both. Upon rest in bed many of these cases clear up. The writer was unable to find a proved case of spontaneous rupture in a healthy kidney. A rupture of a pathological kidney, however, may occur without trauma. A functionless kidney may frequently not cause symptoms when the other kidney is sound. **Nephrectomy** seems the only treatment possible, the time of operation being carefully selected.

sarcoma of, vi. 215, 216, 224

A case of sarcoma of the kidney in a child of 4 years is reported by A. Friedlander (Amer. Jour. Dis. of Child., Sept., 1916), in which the growth, being too large for removal, **X-ray** treatment was applied, with marked though but temporary improvement.

secondary, see Nephritis, Chronic Exudative, ii. 609; also this Index.
stone in, see Nephrolithiasis, vi. 192; also this Index.
surgery of the, vi. 216
surgical, vi. 182
surgical diseases of the, vi. 203
  ureteral catherization in, viii. 678
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transplantation of, vi. 224

By vascular suture Quinby (Jour. Exper. Med., Apr., 1916) was able to remove the dog's kidney, and later replace it. The function of such a kidney showed initial overaction, as compared with the normal kidney, followed by balanced action. A single, reimplanted kidney is able to maintain normal life indefinitely.

traumatic lesions, vi. 224
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  packing in, vi. 224
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For the diagnosis J J. Morton (Jour of Exper Med., Oct., 1916) uses guinea-pigs exposed to a single massive dose of the X-rays. It can thus be made in 8 to 10 days instead of 5 to 7 weeks. The X-ray may be used either shortly before or after the inoculation.

H. D. Furniss (N. Y. State Jour. Med., Nov., 1916) found tubercle bacilli in 85 per cent. of 33 cases and recommends Crabtree's method of search—low speed centrifugation to throw down the pus-cells and subsequent high speed centrifugation of the supernatant fluid, in the sediment of which the bacilli are easily found. In no instance did he find a positive guinea-pig reaction where there was failure to find bacilli in the smear, and in 2 the smear was positive and the pigs negative. Palpation of the ureter through the vagina is emphasized in the diagnosis. Ureteral thickening, thus felt in 45 per cent. of cases, is a great help in determining which is the affected kidney in advanced bladder involvement. He deprecates attempts to catheterize the ureter of the involved side. Excision of the whole ureter down to the bladder with the kidney is advised. **Nephrectomy** in 29 cases gave no operative death and only 2 post-operative deaths, 1 of pulmonary tuberculosis, the other of general miliary tuberculosis.

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hyoscyamus in, v. 578
laxatives in, vi. 192
light therapy in, vi. 363
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After a kidney has been **removed** for tuberculosis, the ureter, according to E. O. Smith (W. Va. Med. Jour., x, 327, 1916), should be thoroughly **cauterized** to prevent surrounding infection. Instillation of

10 per cent. iodoform in liquid albolene or vesical irrigations of mercury bichloride, 1:8000 to 1:15,000, will in time relieve the bladder inflammation and symptoms. Acid urine containing pus-cells which does not culture out bacterial colonies usually means renal tuberculosis. Many cases require repeated examinations for tubercle bacilli, or even a tuberculin reaction.

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Kirchner's technique in hernia, v. 474
Kissingen salt, artificial, viii. 179
Klapp's method in anesthesia, iv. 645
Knee, amputation at or above, vii. 804
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housemaid's, see Housemaid's Knee, viii. 509; also this Index.
hysterical, vi. 129
inflammations, iodoform-glycerin in, vi. 52
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wounds of.

In war wounds of the knee Derache (Arch Méd. Belges, Jan., 1917) finds that if the joint is given a thorough surgical cleansing, it can be left to heal through its own defensive powers. Unless the bone has been shattered, rubber drains should not be used. The joint is merely opened up widely and rinsed out, after which the synovial membrane and capsule are promptly sutured. Early exercise of the joint from the first few days aids in restoring function. Of late, Depage has sutured the wound at once, even with the bone injured. Projectiles are removed, the joint freely rinsed with Dakin's solution or ether, the bones scraped with the curet or gouge, and the joint then sutured in tiers, leaving a small rubber drain in contact with the injured bone for 1 day and immobilizing. Among 22 wounds thus treated, complete recovery with restoration of function was obtained in 86.36 per cent. Only 1 case suppurated and 3 developed ankylosis—a vast improvement over previous methods.

Among 8 cases of severe injuries of the knee-joint treated with continuous Bier hyperemia by Linberger (Münch. med. Woch., lxiii, 331, 1916), 7 were cured. The method checks infection. Fever soon abates, and pain is usually decreased in 24 to 36 hours. Functional results were good.

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La perlèche, vi. 727

Of 1211 children examined by A. L. Smith (Arch. of Pediat., Apr., 1917), 207 were infected with perlèche in some stage. The anerobic streptococcus was found in pure culture in 135 cases, in other cases various forms of staphylococcus or streptococcus. The home surroundings must be made sanitary. Abnormal mouth conditions must be corrected so that salivation will cease. One should then paint the lesions with a 50 per cent. solution of **silver nitrate**, and when dry, apply **Lassar's zinc oxide paste.** If necessary, in a few days, **spirit of camphor** or **alcohol** is used. If the flow of saliva has not decreased, tincture of **belladonna** is given. Any crusts should be soaked with 1:1000 solution of **mercuric chloride**, then taken off and 5 per cent. **ammoniated mercury** ointment applied.

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  twilight sleep in, viii. 106
  pains, **aspirin** in, ii. 221

A. K. Paine (Surg., Gynec. and Obstet., Feb., 1916), favoring **nitrous oxide** analgesia, states that this gas is practical from the beginning of severe pain until the time when obstetric ether would ordinarily be used. Between pains enough gas for 5 or 6 inspirations is allowed to enter the bag. With the beginning of contractions, the patient breathes deeply and rapidly, rebreathing once or twice into the bag, if necessary. This gives an analgesia lasting from 1 to 1½ minutes. The patient does not lose consciousness. The inhalations may be continued for 5 or 6 hours without ill effects. During the stage of expulsion, **ether** is used.

To minimize the pain of labor, H. W. Kostmayer (N. O. Med. and Surg. Jour., Aug., 1916), when the first stage pain becomes annoying, gives **chloral hydrate** in 10-grain dose (0.6 Gm.) repeated in 45 to 60 minutes, as indicated, up to 3 doses. When pain changes to the "bearing down" of the second stage, ⅛ grain (0.008 Gm.) of **morphine** is given as soon as the pain is severe. If labor is retarded in the least, or if it might safely be hastened, **pituitary extract** is given in graduated doses. As dilatation of the vaginal orifice begins, **ether** is given by the open-drop method at the beginning of each pain, and continued until the pain subsides.

The value of **morphine** and **scopolamine** in obviating the shock attending prolonged labor is emphasized by J. O. Polak (Boston Med. and Surg. Jour., Jan. 18, 1917). Among 550 cases thus treated he had but 4 dead babies, all believed from causes independent of morphine and scopolamine. These drugs he uses in border-line contractions of the pelvis, with 80 per cent. of spontaneous deliveries. In 9 heart cases, the drugs acted very well, through the relief of apprehension and consciousness of pain.

  deficient, **pituitrin** in, i. 779
  posture in.

An obstetric chair is used by J. W. Markoe (N. Y. Med. Jour., June 24, 1916), the intention being to have the patient in as near a squatting posture as possible, thus shortening the first stage of labor, usually by several hours. In private homes one may use an ordinary rocking chair, with books under the rockers and the patient's feet on another chair. She is instructed to hold her breath and bear down. This is especially valuable in old primiparæ.

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  tests for lesions, v. 685
    Bárány's, v. 685
    caloric, v. 687
    fistula, v. 687
    galvanic, v. 687
    rhythmic rotary nystagmus, v. 685

A rapid method of examination of the vestibular labyrinth is described by E. J. Moure (Bull. de l'Acad. de méd., Apr. 11, 1916), which consists in making 5 or 6 turns around a vertical pole or cane, with the head bent forward and the eyes closed, then stopping, opening the eyes, and attempting to walk in a straight line. Patients with the labyrinth not excitable can walk almost or quite straight, whereas a normal subject not only cannot do so, but often falls on the side toward which he has been turning. The eccentric labyrinth is that most strongly excited. In cases with a hyperexcitable vestibular apparatus, the patient will at times fall before completing the 5 or 6 turns.

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In lachrymal stricture with catarrhal discharge W. C. Posey (Jour. Ind. State Med. Assoc., Feb., 1917) usually syringes with astringent

washes, and instills a 1 or 2 per cent. solution of ethylhydrocupreine into the conjunctival cul-de-sac several times daily. This solution he finds often highly efficacious in catarrh of the sac, even where pneumococci are not found. Failure after 2 or 3 weeks is followed by extirpation of the sac.

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extirpation of.

J. A. Kearney (Med. Rec., Aug. 19, 1916) removes the tear sac by way of the slit canaliculus under ether anesthesia. No scar on the face follows, and hemorrhage is reduced.

In radical extirpation of the lachrymal sac Siedel's intra-orbital injection in the tract of the nasociliary nerve of 2 c.c. (32 minims) of a 2 per cent. solution of novocaine, with some drops of adrenalin, is advised by E. A. Carrasco (Rev. Asoc. med. argent., xxv, 179, 1916).

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excessive, see Mammary Gland: Galactorrhea, vi. 572; also this Index.
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In 87 cases of *fermentative* or *putrefactive diarrheas of children* treated by Gray (Memphis Med. Mthly., Oct., 1916) with the Bulgarian bacillus there was not a single failure. He is unwilling, however, to omit the preliminary mild purgation with calomel. After that 2 tablets in a little sweetened water with each feeding are ordered. Two cases of *erythema* and 1 of *chronic urticaria* in adults were thus relieved. One case of *chronic intestinal indigestion,* simulating recurrent appendicitis, was much improved. Two cases of *intestinal indigestion,* with much gas and borborygmus, seemed cured; likewise, a case of *pellagra* with persistent red tongue and diarrhea. From preparation to ingestion the cultures must be in a temperature not exceeding 60° F., except for the short period of transit. They should, therefore, be kept in the refrigerator.

treatment, orthoform in, vii. 215
Lactosuria.

Lactosuria.—Milk-sugar is frequently found in the urine of nursing women, usually in very small amounts, although it may be as much as 3 per cent., and give rise to the usual symptoms of diabetes. Lactose is nearly always present two or three days after confinement, and just before milk appears (milk fever); it may also occur a day or two after weaning. Any cause that prevents the milk escaping from the breasts, *e.g.,* mastitis, may cause lactosuria.

Detection of Lactose.—If the urine gives a positive Fehling's test, and also causes extreme deflection of the polarized ray to the right, lactose is probably present. The urine is next treated with an excess of lead acetate, filtered, and to the filtrate ammonia added until a permanent precipitate forms. The fluid is then heated, but not boiled. If a rose-red color does not gradually appear lactose is present.

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Laminectomy with simple exposure of the spinal cord, in the absence of any compression of the cord, according to Elsberg and Bailey (Jour. Amer. Med. Assoc., June 10, 1916), in many cases led to depression or disappearance of the spinal reflexes within 30 minutes, the condition persisting from 6 to 24 hours. Marked improvement, though often temporary, followed, and there were several recoveries from *multiple sclerosis* and *syphilitic paraplegia.*

Local anesthesia is advised by A. C. Strachauer (Journal-Lancet, Feb. 15, 1916) in laminectomies. Because of the angiospastic effect, injection of adrenalin is advised even in laminectomy under general anesthesia. Both shock and hemorrhage are thus reduced to a minimum.

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  paralysis, vi. 291

According to Joseph Rosenthal (Jour. Amer. Med. Assoc., Jan. 29, 1916), paralysis of the recurrent laryngeal can be caused directly in mitral stenosis by pressure of the left auricle, or indirectly through pressure of the pulmonary artery, and finally the changed position of the heart can cause the ligamentum arteriosum to strangulate the nerve. Mitral insufficiency alone will not produce it.

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Ernesto Botella (Revista de Med. y. Cir. Práct., Mar. 14, 1916) strongly advocates suture of the tracheal mucous membrane to the skin in laryngectomy. There is rapid cicatrization, and the assured nutrition of the first tracheal ring prevents sloughing.

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In the treatment of nasolaryngeal inflammations caused by the irritation of cold air, asphyxiating gases, and smoke from guns in soldiers, G. Ferreri (Il Policlinico, Sez. Prat., Jan. 23 and Feb. 6, 1916) recommends inhalations. The mess tin is filled with hot water, into which are poured some drops of a 5 per cent. alcoholic solution of **balsam of Peru**, 10 per cent. tincture of **benzoin**, 5 per cent. of **eucalyptus**, 0.25 per cent. **menthol**, 0.5 per cent. **carbolic acid**, or 10 per cent. **laurel water**, separately or in combination. Sprays of solutions of **sulphate of alum and potassium** may be applied, or the following formula used: **Sodium benzoate** 2 Gm. (30 grains), **cocaine hydrochloride** 20 cg. (3 grains), **menthol** 5 cg. (3/4 grain), pure **alcohol** 10 Gm. (2½ drams), distilled water 120 Gm. (4 ounces), and **laurel water** 20 Gm. (5 drams). Insufflations of powders into the larynx are useful. **Iodoform** deodorized with essence of mint (5 drops per 1 Gm.—15 grains); **tannin**, **aristol**, or **calomel**. For dysphagia and neuralgia: **Chloroform water**, **thymol** 10 cg. (1½ grains), basic **cocaine** 20 cg. (3 grains), **menthol** 20 cg. (3 grains), pure **alcohol** 100 Gm. (3⅓ ounces), 1 teaspoonful in a tumbler of tepid water; or **salol** 10 cg. (1½ grains), basic cocaine, 20 cg. (3 grains), menthol 10 cg. (1½ grains), pure alcohol 100 Gm. (3⅓ ounces), a teaspoonful as before. Some of this is taken into the mouth and the head sharply bent backwards.

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Dry cupping was found valuable by W. Stuart-Low (Lancet, Jan. 23, 1915) in many laryngeal affections, including catarrhal laryngitis, tuberculosis, and threatened edema. The cups are placed on the posterior half of the thyrohyoid membrane on either side and over the cricothyroid membrane, both laterally and anteriorly. Care is taken at first to determine the degree and length of suction which can be borne without ecchymosis.

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Imperatori (N. Y. State Jour. Med., xvi, 16, 1916) warns that in direct laryngoscopy in children, and especially in infants, if the procedure is prolonged, there is marked danger of edema of the larynx. Gagging invariably signifies pressing of the larynx forward with the beak of the instrument in the esophagus. The spatula should be warmed before introduction.

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To prevent fracture of the alveolus in suspension laryngoscopy, R. C. Lynch (Trans. Amer. Laryn. Assoc., May, 1916) places a strap under the occiput and clamps it into the angles of the pear-shaped ring, thus relieving the pressure against the teeth. He also uses dental impression spoons filled with moulding compound which offers complete protection to the teeth.

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G. D. Stewart (Annals of Surg., Dec., 1915) states that laryngo-fissure is applicable to over ⅓ of all cases, those in the incipient stages. It is contraindicated where the arytenoid cartilage and the interarytenoid fold are involved, also in other extrinsic cancers. If the extent of involvement has not been absolutely determined beforehand, one should be prepared for a semi- or complete laryngectomy. The mortality of laryngo-fissure is but 0.2 per cent. Speech is always possible after it.

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Discussing 16 cases of gunshot wounds of the larynx and trachea Kofler and Fruehwald (Wiener klin. Woch., xxviii, 1337, 1915) note that the symptoms complained of in the home hospital included perichondritis, smooth or nodular swellings, scars and cicatricial adhesions in the form of web-like membranes, in 1 case a hematoma, and speech difficulties due to nervous or inflammatory changes of the cords. Treatment was usually expectant. In 3 cases exuberant granulations were removed with sharp forceps, with improvement. Three cases were dilated with bougies or dilators, with fair results. In 1 case an adhesion of the subglottic space was removed, with complete recovery.

Tracheolaryngostomy was practised by Moure and Canuyt (Revue de Chir., xxxv, No. 7-8, 1916) in 31 cases of war wounds of the larynx and trachea, with constant success, the men breathing naturally, and speaking with a loud, intelligible voice.

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A type of laryngeal stenosis in young children characterized by acute onset with coryza, croupy cough, increasing dyspnea, and moderate fever is describd by Ernest Köck (Münch. med. Woch., Aug. 18, 1914). Some cases cleared up after 4 or 5 days under treatment for croup and bronchitis. A number required intubation, and some tracheotomy. In all, cultures from the larynx were negative for diphtheria, but showed streptococci and staphylococci. The diagnosis of atypical pseudocroup was finally made. Marked inflammatory changes caused by irritation of the tube and cannula were a feature. Where diphtheria is excluded, and a pyogenic infection proven, a primary tracheotomy should be done; where pyogenic infection is proven after intubation, a second tracheotomy.

In laryngeal stenosis due to immobilized median position of the vocal cords, Iwanoff (Revue Hebd. de Laryn., d'Otol., et de Rhin., Feb. 21, 1914) recommends extirpation of the arytenoid cartilage. In 4 other cases, the same writer (*loc. cit.,* Feb. 28, 1914) practised with success resection of the vocal cords. The voice was not much impaired.

In chronic stenosis in a case of recurring papillomas L. Mahler (Ugeskrift f. Laeger, July 6, 1916) practised laryngostomy with good results.

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According to S. Iglauer (Laryngoscope, xxvi, 1237, 1916), more ultimate cures are obtained by the electrocautery in laryngeal tuberculosis than with any other procedure. The method is not advised, however, if the lung condition is progressive.

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In tuberculous laryngitis J. W. Wright (Ind. Med. Jour., Aug., 1916) finds a solution of 5 per cent. **menthol** and 5 per cent. **Guaiacol in olive oil** injected endolaryngeally useful to alleviate the desire to clear the throat and give rest to the parts. If there is much thickening between the arytenoids, he touches the tissue with crystals of **trichloracetic acid.**

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During the stage of infiltration and early ulceration in laryngeal tuberculosis J. J. King (Intern. Jour. of Surg., Feb., 1916) makes an intratracheal injection of a 20 per cent. solution of **menthol in liquid albolene.** The ulcer may be **cauterized** lightly.

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In the acute attack of plumbism, L. T. de M. Sajous (N. Y. Med. Jour., Mar. 10, 17 and 31, 1917) urges care that the clothing worn during the attack be entirely free of lead The skin should be cleansed by a full bath with friction or by successive local washings. Mouth washings, careful cleansing of the teeth, and irrigation of the nasal cavities with warm saline solution are indicated. Prompt arrest of the colic with amyl nitrite or nitroglycerin may be attempted, with subsequent use of erythrol tetranitrate or sodium nitrite. The nitrites are merely auxiliaries of atropine and morphine. Removal of the bradycardia during lead colic was observed by the writer under moderate doses of belladonna tincture. Where the pronounced analgesic action of morphine is no longer essential, papaverine sulphate, ⅔ grain (0.04 Gm.), may be used to relax the intestinal spasm. Constipation is often, in the severe cases, best treated at first by daily colonic injections of warm water, purgatives by mouth increasing nausea and vomiting. Later, the bowels should be caused to act at least once and preferably 2 or 3 times daily. For elimination by diaphoresis a full dose of sweet spirit of niter 3 times, and later twice, a day is effectual.

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Studies in 16 patients with old lead projectiles embedded in their tissues are reported by Loeper and Verpy (Progrès méd., xl, 81, 1916). Unaccountable symptoms had been observed—hypertension, albuminuria and casts, constipation, colic, and anemia. The urines showed lead in

6 of the 16 to the amount of 0.5 to 1 mg. per liter of urine, or an excretion of more than 1 mg. daily. The intestinal and nervous symptoms could not be relieved, but in 3 cases the albuminuria disappeared completely within 2 to 3 weeks after removal of the lead bullet. Two patients with anemia and basophilic granulations were also benefited.

In one year 2 cases of mild lead poisoning from drinking water in Rhode Island came to the attention of S. De M. Gage (Bull. State Board of Health R. I., Jan., 1917). In 1 case water was conveyed by about 50 feet of lead pipe. The urine showed lead. In the second, the water was drawn by a pump with an iron pipe, but there was also about 3 feet of lead pipe from a former connection. Small amounts of lead were found in the urine. The amounts in the water were much smaller than are commonly considered dangerous, and the patient was probably unusually susceptible. In the morning the pipes should be flushed out before drinking water.

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Leeching followed by cupping is considered superior to venesection by L. Plantier (Paris méd., Aug. 19, 1916). Two groups of 3 or 4 leeches are applied, each group in a liqueur glass, some distance apart on the lateral aspect of the thorax or abdomen. A flow of blood having thus been well established, the gorged leeches are removed, and the hemorrhage maintained or accelerated at will by applying cups alternately to the 2 groups of leech wounds. An improvement is to use a cup with suction bulb and graduated receptacle.

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Among 42 cases of leprosy treated by McCoy and Hollmann (Public Health Bulletin No. 75, U. S. Public Health Service, Jan., 1916) with **chaulmoogra oil** hypodermically, 16 received injections for 10 to 17 months. Of these, 10 were improved and 4 rendered stationary, while 2 progressed. Most cases took the oil by mouth at the same time, and a number had **carbon dioxide snow** applied locally. Weekly injections of 5 c.c. (1¼ drams) of a mixture containing 50 per cent. of the oil seemed about all that was well borne. Larger doses led to persistent infiltration. The oil mixtures were sterilized at 100° C. for 15 minutes.

Leprosy is treated by V. G. Heiser (N. Y. Med. Jour., Feb. 12, 1916) with the following: **Chaulmoogra oil**, and **camphorated oil**, of each 60 c.c. (2 ounces); **resorcinol**, 4 Gm. (1 dram). Mix and dissolve with the aid of heat on a water bath and filter. In an illustrative case he first injected into the buttocks 2 c.c. (32 minims) of the mixture every 8 days. The dose was at length increased up to 5 c.c. (1¼ drams) every 3 days, then reduced to 2 c.c. (32 minims), and then gradually increased to 10 c.c. (2½ drams), lately given in alternate weeks. Quicker results are obtained when one can inject into large leprous deposits or divide the dose in a number of smaller infiltrations. Five cases have been reported as cured and remaining so for over 2 years. In Manila 23 lepers were discharged from the colony as cured. Probably 200 other cases were showing improvement.

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europhen in, vi. 329
galvanocautery in, vi. 330
guaiacol in, vi. 327
gynocardia oil in, vi. 326

In the fractionization of **chaulmoogra oil**, states Leonard Rogers (Brit. Med. Jour., Oct. 21, 1916), the fraction with the lowest melting point yields fatty acids the sodium salts of which are readily soluble in water, and only moderately irritant. This fraction he terms the gynocardic acid fraction. **Sodium gynocardate** may be given intravenously to man in a 2 or 3 per cent. solution to which 0.5 per cent. **phenol** has been added, and sterilized in the autoclave. Doses of 6 to 50 mg. (1/10 to 5/6 grains) were given without toxic effects. After such doses there is often a local reaction and sometimes fever, after which the affected tissues soften and the nodules diminish in size. These results could not have been obtained from subcutaneous use even in much larger doses. Twenty cases treated intravenously all showed marked improvement, with healing of lesions, disappearance of bacilli from open lesions or tubercles, return of sensation in anesthetic areas, and restoration of function in paralyzed parts.

hydrogen dioxide in, vi. 327
ichthyol in, vi. 327-329
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Leprous pharyngitis, vii. 430
Leptandra, vi. 330
Leptomeningitis, v. 196; vi. 594
Leube-Riegel test-meal, i. 254
Leucinuria.

Leucin ($C_6H_{13}NO_2$) and tyrosin ($C_9H_{11}NO_3$), related decomposition-products of proteids, usually occur together in the urine and in the organism itself. When retrograde tissue changes are rapid, as in extensive suppuration and gangrene, they form in large amounts and pass into the urine, largely supplementing urea. They also occur in the urine in acute atrophy of the liver, acute phosphorus poisoning, and at times in leukemia, typhoid fever, and variola. Leucin is normally present in the liver, pancreas, spleen, lymph glands, salivary glands, and thyroid and thymus glands.

Detection of Leucin.—Microscopical examination of a urinary sediment containing leucin will reveal it in the form of yellowish, highly refractile spheres, resembling oil-globules. When pure it crystallizes in scales or rosettes, often of irregular shapes, and has a greasy feel. It is insoluble in ether, thus differentiating it from oil-globules and in mineral acids; it is partly soluble in water and alcohol, and completely in caustic alkalies. Chemical tests are confirmatory if enough leucin is available.

Hoffmeister's Test.—Heating the solution with mercury protonitrate yields a deposit of metallic mercury.

Scherer's Test.—When evaporated with nitric acid on platinum-foil leucin leaves a colorless residue which, if heated with potassium hydroxide, forms drops of an oil-like fluid which does not adhere to the platinum.

Sublimation Test.—Leucin heated in a glass tube open at both ends to about 348° F. (170° C.) sublimes in feathery particles. Further heat fuses it, and causes it mostly to disappear.

Separation Test.—Evaporate the urine, and dissolve the residue in boiling alcohol. When cooled the leucin will be deposited in whitish plates or masses.

Leucocytes, or white corpuscles, v. 380
  counting of, v. 375
  differential count of, v. 380
Leucocythemia, see Leukemia.
Leucocytic extract.

Work with a leucocytic extract prepared from the blood of normal animals is reported by W. E. R. Schotstaedt (Trans. Amer. Assoc. of Immunologists; Med. Rec., Oct. 7, 1916). Subcutaneous injections in normal subjects and patients with acute infections produced a marked leucocytosis, often of 300 per cent., and highest within 10 to 12 hours. Clinically, striking benefit was obtained in acute infections such as *furunculosis, pneumonia, bronchitis* and *acute tonsillitis.* Chronic infections showed less improvement.

Leucocytometer of Thoma-Zeiss, v. 375
Leucocytosis, v. 381
Leucoderma, vi. 331
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Leucopenia, v. 381
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  borax solution in, viii. 769, 770
  chromium trioxide in, iii. 337
  copper sulphate solution in, viii. 770
  creosote in, iii. 689
  cubeb in, iii. 711
  eucalyptus in, viii. 770
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  hematoxylon extract in, v. 394
  hydrastis in, v. 545, 547
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Leucorrhea (*continued*).
  ichthyol in, v. 637
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  pareira in, vii. 330
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  potassium bicarbonate solution in, vii. 581
  potassium permanganate in, vi. 574
  saline solution, normal, in, viii. 770
  saponaria root decoction in, viii. 770
  silver nitrate in, viii. 140
  sodium bicarbonate in, viii. 191
  sodium borate in, ii. 588; viii. 770
  sodium carbonate in, viii. 769
  sodium hypochlorite in, viii. 770

In leucorrhea resulting from catarrh of the cervix and vagina, E. Zweifel (Med. Klin., Nu. 47, 1914) introduces a tampon saturated with a 50 per cent. **sugar solution** followed by irrigation with 2 tablespoonfuls of hot water, the patient in a recumbent position. Improvement is noticed after eight or ten days. Later the cervix is scarified with **formalin.** Even still better results are obtained with douches of 0.3 to 0.5 per cent. of **lactic-acid solutions,** especially if the cervix erosions are first swabbed with a 5 per cent. **silver solution.**

  sumbul in, viii. 433
  tannic acid in, viii. 498
  thymol solution in, viii. 533
  uva ursi in, viii. 763
  zinc sulphate in, viii. 770
Leukemia, vi. 331
  arsenic in, ii. 140; vi. 342, 343
  atoxyl in, ii. 261
  benzol in, vi. 342, 345, 346, 354

In using **benzol** in leukemia, Barry and Ketchem (Ind. State Med. Assoc. Jour., Aug., 1916) warn not to carry its effects too far, destroying the function of the bone marrow. The patient ought to be in a hospital, in bed; the alimentary tract, kidneys, and liver, watched carefully; blood-counts made every few days; the dosage not increased without definite warrant, and the benzol stopped considerably before the white count has returned to normal.

  blood-picture in, v. 382; vi. 337
  bone-marrow in, i. 793
  climatic treatment in, vi. 716
  Coley's mixed toxins in, vi. 344
  oxygen inhalations in, vii. 274
  radium in, vi. 344

Radium treatment by surface application is advocated by Ordway (Boston Med. and Surg. Jour., Apr. 5, 1917) in cases of leukemia resistant to the X-ray and benzol. The resulting remission may last months or years.

  salvarsan in, iv. 225
  sodium cacodylate in, ii. 704
  spleen extract, i. 795
  thorium x in, vi. 344, 345
  X-rays in, vi. 339, 340, 342-345; viii. 828

Where neither **X-rays** nor **benzol** alone is sufficient to control the disease, the two may be effective when given simultaneously, according to Edmund Myers (N. W. Medicine, Sept., 1916).

X-ray treatment is held by H. K. Pancoast (Amer. Jour. of röntgenology, Jan., 1917) the most successful and safest agent. The rays should be directed mainly against the bone-marrow. Treatment of the spleen consists in dividing it into zones of 8 to 10 cm. in diameter; crossfiring is then practised from the front, side, and back. Only 1 area is treated at a time. **Arsenic** in small doses is advocated where improvement ceases; also in cases with a low red count or the reds and hemoglobin diminishing.

  acute, vi. 336
  chronic lymphoid, vi. 334
  indophenoloxidase reaction in, vi. 338
  lymphatic, **magnesium sulphate** in, vi. 476
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Leukemic retinitis, vii. 199
Leukoplakia, viii. 566
    copper sulphate in, viii. 566
    excision, local, in, viii. 566

According to Robert Levy (Laryngoscope, Aug., 1915), **fulguration** offers considerable encouragement in the treatment of leukoplakia.

    hydrogen dioxide in, v. 571
    pilocarpine in, vii. 471
    potassium iodide in, viii. 566
    salicylic acid in, viii. 566
    X-rays in, viii. 566
  of the vagina, viii. 776
Lice, see Pediculosis, v. 160; also this Index.
Lichen, **belladonna** in, ii. 451
    caustic potash in, vii. 581
    hydrocyanic acid in, v. 564
    phenol in, vii. 443
    radium in, viii. 829
    silver nitrate in, viii. 139
    sodium bicarbonate in, viii. 189
  menti, v. 156
  planus, vi. 355
    arsenic in, ii. 142, 144; vi. 355
    atoxyl in, ii. 262
    cade oil in, ii. 709
    change of climate in, vi. 355
    chrysarobin in, vi. 355
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    Donovan's solution in, vi. 355
    menthol in, vi. 355
    mercury in, vi. 355
    nitric acid (dilute) in, vi. 355
    phenol in, vi. 355
    potassium chlorate in, vi. 355
    quinine in, vi. 355
    salicin in, vi. 355
    salicylic acid in, vi. 355
    salvarsan in, iv. 224
    tar in, iv. 355; viii. 502
    X-rays in, vi. 355
  ruber acuminatus, vi. 355
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    arsenic in, ii. 262, 263; vi. 356
    chrysarobin in, vi. 356
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Lichen, ruber acuminatus (*continued*).
    salvarsan in, iv. 224
    sodium cacodylate in, ii. 705
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  urticatus, see Urticaria Papulosa, viii. 740; also this Index.
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  powder, compound, viii. 116, 427
Lids, abscess of the, see Eyelids, Abscess of, iv. 720; also this Index.
  granular, see Conjunctivitis, Granular, iii. 565; also this Index.
    copper crystals in, iii. 644
Lieben's iodoform test for acetone, i. 239
Lienteric diarrhea, **pancreatin** in, vii. 299
Ligation of arteries, **beta-eucaine infiltration anesthesia** in, iv. 702

Collaterals develop better, according to Sehrt (Med. Klinik, Dec. 17, 1916), after ligation of an artery when the vein is ligated too. The tendency to gangrene is also reduced.

Light therapy, vi. 356

The new Simpson light, according to Harmer and Cumberbatch (Lancet, Jan. 8, 1916), is made up of visible rays—violet to red—and invisible rays—heat rays and ultra-violet rays—benefit being mainly due to the last. The light is emitted from an electric arc formed between electrodes chiefly consisting of a tungstate of iron and manganese. It produces an erythema of short duration 5 or 6 hours after the exposure. Among conditions satisfactorily treated were *rodent ulcer, lupus, asthma, vasomotor rhinitis, nasal catarrh* and *rhinitis,* and *otosclerosis.* It seems to stimulate healing of *wounds.*

Many forms of skin disease react readily to ultra-violet light, says F. S. Hawks (Pract., Jan., 1917), particularly *lupus, sycosis, alopecia areata, acne vulgaris,* and *rosacea,* and certain forms of *rodent ulcer, nevus, eczema,* and *psoriasis. Chilblains* are very

amenable. It promotes healing of *varicose ulcers, sloughing buboes* and *lacerated wounds,* and keeps *skin grafts* healthy. It relieves *gouty, rheumatic, myalgic,* and also *obscure abdominal* and *pelvic pains.*

According to George and Toren (Ophthalmic Record, May, 1917), light from the leucodescent lamp is applicable in nearly all *corneal diseases* (including *corneal opacities*), *iritis, irido-cyclitis, episcleritis, orbital abscesses,* and in fact whenever dry heat is indicated. In recent *injuries* it protects against infection.

Lignum vitæ, see Guaiac, v. 143
Lilienthal's colostomy, i. 80
  method in ankylosis, vi. 150
Lime water, ii. 710, 720
  waters, vi. 712
Lingual papillitis, viii. 564
  galvanocautery in, viii. 565
  silver nitrate in, viii. 565
Linitis plastica.

Linitis plastica hypertrophica (leather bottle stomach) is described by A. McGlannan (Jour. Amer. Med. Assoc., Jan. 8, 1916), who reports a case. There is great thickening of the stomach walls, due to fibrosis, involving principally the submucosa. Gastrectomy is the operation of choice for the localized form, and for the diffuse form complete gastrectomy has been done a few times. The usual operation is gastro-enterostomy, and occasionally gastrojejunostomy.

Linum, vi. 364
Lion's tooth, see Taraxacum, viii. 503
Lipomata, local anesthesia in removal of, iii. 395, 499; iv. 698; vii. 103; viii. 398
  of external genital organs, cocaine anesthesia in, iii. 493
  of mediastinum, viii. 551
  of peritoneum, vii. 395
  of stomach, viii. 394
  of vagina, viii. 775
Lipomatosis universalis, see Obesity, vii. 151; also this Index.
Lips, angiomata of, ii. 518
  carcinoma of, vi. 728; viii. 438

At a recent meeting of the American Dermatological Society, according to R. H. Boggs (Interst. Med. Jour., xxiii, 114, 1916), it was agreed that in epithelioma of the lower lip radiotherapy is a legitimate and successful treatment in properly qualified hands. The writer prefers radium for the lip and radiation with the Coolidge tube for the adjacent glands. Treatment of the glands is essential even in the smallest lesion. All precancerous lesions should be treated by a method that leaves no scar.

    cocaine anesthesia in, iii. 493, 499
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    benzoin tincture in, ii. 456
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  hypertrophy of, viii. 437
    plastic surgery in, viii. 437
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  restoration of upper, viii. 439
    Dieffenbach's wellenschnitt in, viii. 439
    Estlander's method in, viii. 439
  tumors of, vi. 727
Lipuria.

Normal urine contains slight traces of fatty matters—palmitins and stearin—about 2 grains (0.13 Gm.) per gallon (4.54 liters). Lipuria is physiological in pregnancy. Roberts has recorded several cases of

pure oil in the urine after ingestion of codliver-oil. Small quantities of fat have been met with in chronic parenchymatous nephritis, fatty renal changes, acute yellow atrophy of the liver, phosphorus poisoning, diabetes mellitus (often alternating with sugar), hydronephrosis, heart disease, pancreatic disease (oil noted in urine before appearing in stools), after fractures, and in chyluria. Much fat renders the urine turbid or milky.

Detection of Fat in Urine.—Under the microscope fatty matter appears in highly-refracting globules of various sizes, with dark margins.

Ether Test.—Shake the urine, add an equal volume of ether, shake again, cork tightly and set aside until the ethereal portion has risen to the top. Pour it of, and allow to evaporate. The residue will show if fat or oil is present. Fat in a milky, opaque urine strongly indicated chyluria, *q.v.*, iii. 339.

- Liquid air, vii. 783
- Lister's antiseptic solution, viii. 46
- Lithemia, vi. 365
  - **alcohol forbidden in, vi. 366**
  - **bitter tonics in, vi. 366**
  - **diet in, vi. 366**
  - **hydrochloric acid in, vi. 366**
  - **lithia water in, vi. 366**
  - **mastication (thorough) in, vi. 366**
  - **nitric acid in, vii. 45**
  - **nux vomica in, vi. 366**
  - **outdoor exercise in, vi. 366**
  - **potassium bitartrate in, vii. 578**
    - **citrate in, vii. 578**
  - **rest in, vi. 366**
  - **water, copious use in, vi. 366**
- Lithium, vi. 366
  - bromide, see Bromides, ii, 635
  - poisoning by, vi. 367
- Litholapaxy.
  - **cocaine anesthesia in, iii. 488**
- Lithotomy, viii. 728
  - perineal, viii. 729
    - lateral, viii. 729
      - iodoform gauze in, viii. 730
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    - median, viii. 730
  - suprapubic, viii. 730
    - **boric acid injections in, viii. 730**
- Lithotomy, suprapubic (*continued*).
    - **irrigation of bladder in, viii. 730, 731**
    - **rectal bag in, viii. 730**
    - **siphon drainage in, viii. 731**
- Lithotrity, see Litholapaxy.
- Lithuria.

This condition is a persistent excess of uric acid and urates in the urine. Uric acid occurs usually in combination with alkalies, but may be found free. Normal urine contains about 0.4 part of uric acid per thousand, a ratio of about 1 to 45 of urea Normal urine usually deposits uric acid crystals after standing ten or more hours. More rapid deposition indicates: (*a*) a temporary increase of uric acid from excess of nitrogenous food; (*b*) temporary high acidity; (*c*) deficiency in mineral salts. Uric acid is increased pathologically in: (*a*) lithemia (uricemia, uric acid or gouty diathesis); (*b*) gout and rheumatism; (*c*) fever; (*d*) leukemia and pernicious anemia; (*e*) pulmonary affections with hampered interchange of gases; (*f*) from a habitual highly nitrogenous diet. The acid is deposited in yellowish-red or cayenne pepper grains.

Urates occur principally as acid sodium, calcium and ammonium urates. They form a pinkish, "brick-dust" sediment, usually abundant and finally granular, with the urine above cloudy. Normally they may appear (*a*) in any concentrated urine exposed to cold; (*b*) after a meal rich in proteins; (*c*) in scanty urine from profuse perspiration, diarrhea, fever, etc. Pathologically, they are increased in the presence of an excess of uric acid.

Detection of Uric Acid and Urates.—Microscopical examination will reveal uric acid in a variety of rhombic prisms—"whetstone-shaped," "crosses," "lozenges" and others, singly or in agglomerations. Acid sodium urate occurs in minute amorphous granules or crystals—star-shaped, needle-like clusters, often of fan-shaped arrangement, more or less deeply stained brown or pink. Acid potassium urate occurs only in amorphous form. Acid calcium urate occurs rarely and in minute quantities as a white or grayish amorphous powder. Ammonium urate occurs in dark brown, spherical masses studded with fine, sharp spicules—"thorn-apple crystals"—and is oftenest found with calcium phosphate and triple phosphate crystals. It is the only urate sediment found in alkaline urine. Mixed urates occur as reddish granules.

Heat Test.—Urates are dissolved by heating the urine.

Acid Test.—Upon strong acidulation with hydrochloric acid and setting aside for 24 hours, crystals of uric acid are formed.

Murexid Test.—Evaporate a little urine at low heat over an alcohol lamp or Bunsen flame. Add a few drops of nitric acid, and cautiously evaporate to dryness; a red residue remains. After allowing to cool, add a drop or two of ammonia, and a purple shade, due to murexid, will appear. If potassium hydroxide solution is substituted, an evanescent violet-blue results.

Estimate of Acidity (Martinet's).—To 20 drops of decinormal sodium hydrate solution add 2 drops of a 1 per cent. alcoholic solution of phenolphthalein. Heat to boiling. Add urine, drop by drop, until the pink color vanishes entirely. The total acidity is expressed in terms of sulphuric acid by dividing 98 by the number of drops of urine required for decoloration.

Little tetanus, see Tetany, iii. 628; also this Index.
Little's disease, iii. 114
Liver abscess, vi. 400

According to I. Blanes (Rev. Asoc. méd. argent., xxv, 170, 1916), in liver abscesses X-ray plates give more information than the symptoms. Permitting of change of position of the patient, radioscopy is superior to the X-ray plate in the localization of the abscess. Exploratory puncture is indicated where X-rays are negative.

Liver abscess (*continued*).
- aspiration in, vi. 406-408
- bacterial vaccines in, ii. 336, 368
- blood-picture in, v. 384
- chloral hydrate in, vi. 406
- drainage in, vi. 406-408
- emetine in, iv. 452; vi. 60, 406-408
- formaldehyde in, vi. 408
- hydrogen dioxide in, vi. 408
- iodine tincture in, vi. 407
- ipecac in, vi. 61, 406, 407
- irrigation in, vi. 407, 408
- local anesthesia in, vi. 407
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- saline solution in, vi. 407
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acute yellow atrophy of, vi. 397
- diet in, vi. 399
- ice bag in, vi. 399
- saline solution in, vi. 399
- salvarsan in, iv. 206

In a case of acute yellow atrophy of the liver treated by C. P. Longridge (Jour. Royal Army Méd. Corps; Med. Rec., Oct. 7, 1916) the sole dependence was placed on hypodermic sodium bicarbonate injections. One week after admission to the hospital the patient began to improve, the liver dullness rapidly receding, and was well in 1 month.

adenomata of, ii. 764
amebic, emetine in, iv. 448, 451
amyloid, vi. 418
angiomata of, ii. 523; vi. 412
carcinoma of, vi. 409

In the differential diagnosis between malignant and echinococcus disease of the liver, the age over 50 speaks in favor of cancer, states A. Ferrannini (Riforma medica, xxxii, No. 44, 1916), also a sudden onset of intense pain, enlargement of the liver, and the finding of hard nodes in it, the absence of eosinophilia and of leucocytosis in general, the reduction of nitrogen and increase in urobilin in the urine, and the coexistence of stomach trouble. The growth is more apt to be a sarcoma than a carcinoma if there are no extra-abdominal metastases, ascites, or jaundice.

Liver, carcinoma of (*continued*).
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  cardiac, see Liver, Congestion, Passive. vi. 372; also this Index.
  cirrhosis of, see Cirrhosis of the Liver, iii. 396; also this Index.
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    rhamnus purshiana in, vii. 822
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  congestion, constipation of, sodium bicarbonate in, viii. 188
    sodium citrate in, viii. 188
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  cyanotic atrophy, see Liver, Congestion, Passive, vi. 372; also this Index.
  cysts of, surgical measures in, i. 97
Liver (*continued*).
  diseases of, vi. 368

According to Gustav Hillel (Med. Klinik, Mar. 26, 1916), both organic and functional nervous affections may depend on some disturbance of the liver, either organic or functional. The nervous system is affected by ammonium compounds, especially the carbamides. Still other harmful metabolic products may arise.

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    Bier's hyperemia in, vi. 710
    calomel as diuretic in, vi. 677
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  inflammation of, see Hepatitis, this Index.
  injuries of, i. 111, 134, see also under Abdomen, this Index.
    surgical measures in, i. 125

According to O. J. Fay (Trans. West. Surg. Assoc., Dec., 1916), **laparotomy** is indicated in every case of probable rupture of the liver because of the danger from hemorrhage. A thorough examination must also be made of the other abdominal viscera. **Ligation** of the **larger vessels** is indicated wherever there is troublesome bleeding from accessible wounds.

In **suturing** the liver, A. L. Soresi (Riforma Medica, Mar. 2, 1917) passes the needle, threaded with catgut, through a small wheel made of fine silver wire. Each wheel, the diameter of which varies from 6 to 15 mm., has 8 spokes. The sutures thus never tear out, and the suturing takes less time.

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  torpid, **ammonium chloride** in, i. 620
    blue pill in, vi. 671
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To improve intestinal conditions among soldiers Rosenthal (Med. Rec., Aug. 5, 1916) boils fresh orange peel in 1 pint of water for ½ hour. The softened peel is then boiled for another ½ hour in fresh, slightly sweetened water, removed and dried. The peel of 1 orange is an average dose. The intestine is acted upon mechanically, and there is also an increased flow of bile.

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Local anesthesia, see Various Anesthetics.
Localization, cerebral, v. 175
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Locke's solution, v. 679; viii. 200
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Locomotor ataxia, vi. 121, 122; see Tabes Dorsalis, viii. 474
Loeffler's solution, vi. 649
Loomis's mixture, vii. 175
Loose bodies in joints, see Joints, Loose Bodies in, vi. 139; also this Index.
Lophophorine, i. 698
Lorenz bloodless method, iv. 304
  immobilization method, vi. 163

Loreta's operation in stenosis of esophagus, v. 554
Lorthioir's technique in hernia, v. 470
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Lovell's pollen vaccine, v. 608
Low brows, **paraffin injections** in, viii. 443
Ludwig's angina, vii. 428
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  salt solution in, vii. 428
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Lumbago, viii. 21

The name "trench back" is applied by J. D. Sandes (W. Lond. Med. Jour., Jan., 1916) to conditions of the back arising from injury caused either by a fall or blow or the impact of heavy weights, such as earth or sandbags. The symptoms are those of a subacute lumbago. In the treatment he advises **ionic medication** with a 1 per cent., solution of **sodium salicylate** applied to the lumbar regions with a pad of lint, on which is placed a mail chain or copper gauze. A larger pad soaked in saline is fixed to the upper dorsal region and connected to the positive pole. Thirty or 40 milliampères are given at first, later 100, for ½ hour. Six applications usually suffice to insure recovery.

  acetphenetidin in, i. 251
  acupuncture in, i. 347
  ammonia in, i. 612
  antipyrin in, ii. 46
  belladonna plaster in, ii. 444
  Bier's hyperemia in, v. 594
  chloral in, iii. 211
  chloroform liniment in, iii. 264
  hot compresses in, viii. 814
  ichthyol in, v. 635
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  mustard plaster, iii. 15
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Lund's technique in visceroptosis, v. 784
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Acute pulmonary abscess was treated with **artificial pneumothorax** in 2 cases by W. D. Tewksbury (Wash. Med. Annals, Mar., 1917), with promise of cure in another. In both the abscess had ruptured through a bronchus. Neither abscess was tuberculous.

According to C. W. Richardson (Trans. Amer. Med. Assoc.; N. Y. Med. Jour., June 30, 1917), the deathrate from acute pulmonary abscess upon medical or expectant treatment is 60 per cent.; upon surgical treatment, 30 per cent.; and, so far, under artificial pneumothorax treatment, 10 per cent.

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  differential pressure apparatus in, vi. 443
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  posture frequently changed in, vi. 460
  rhythmic traction of tongue in, vi. 461
  tepid baths in, vi. 461
  tonics in, vi. 461
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In a report based on 71 positive cases examined at the Mayo Clinic, Moore and Carman (Amer. Jour. Röntgenol., iii, 126, 1916) conclude that metastatic lung malignancy is a definite X-ray entity, appearing as clear-cut areas of increased density. Often the diagnosis can only thus be established, relative absence of physical findings being a striking feature.
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  aconite tincture in, vi. 439
  bromides in, vi. 439
  creosote carbonate in, vi. 440
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  ipecac in, vi. 59
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In a case of pulmonary embolism treated by Péraire and Baumann

(Bull. et mém. de la Soc. de méd. de Paris, Dec. 22, 1916), occurring in a woman of 52, 6 days after abdominal panhysterectomy, a fatal issue seemed likely when electric vibratory instrument was placed in the angle between the spine and the tenth rib, near the latter, the result being a strong reflex contraction of the diaphragm. At once the inspirations grew deeper, and the dyspnea less. On interrupting, the dyspnea grew worse again. After 20 minutes' treatment breathing took place with almost complete comfort.

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    chlorphenol in, vii. 445
    creosote inhalations in, iii. 686
    hydrogen dioxide in, iii. 162
    phenol inhalations in, vii. 442
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  alkalies in, vi. 450
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  aluminum carbonate in, i. 590
  amyl nitrite in, vi. 448; vii. 54, 56
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In hemoptysis, A. E. Greer (Texas Med. Jour., Feb., 1916) advises lung compression by nitrogen, 400 to 500 c.c. being introduced into the pleural cavity near the bleeding area. The location of the latter is determined by sudden bubbling râles over an area of diminished breath sounds. Early cases of hemoptysis in lung tuberculosis are the most suitable for the measure.

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  tuberculous abscess of, pneumotomy in, iii. 190
  tumors of, iii. 162; vi. 465
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According to Léon Binet (Presse méd., Mar. 23, 1916), explosion of a large projectile 2 or more yards away may produce slight or serious lung injury in the absence of any external wound.

    penetrating, iii. 123

In gunshot wounds of the lungs with hemothorax, W. Hale White (Lancet, Dec. 4, 1915) states that pyrexia is common, but does not always mean infection. The latter should be suspected when the evening temperature is high, daily excursions wide, and general symptoms severe. Removal of some of the fluid may accelerate absorption of the rest, but it is usually wise to take away as much as possible. After aspiration of blood there is no reaccumulation.

      amyl nitrite in, iii. 125
      antiseptic dressing in, iii. 126
      nitroglycerin in, iii. 126
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That none of 100 soldiers with gunshot wounds of the lungs examined or treated from 5 to 20 days after injury died is ascribed by Ehret (Münch. med. Woch., Apr. 20, 1915) to his practice of puncturing the chest cavity and letting in air. This aids in expelling secretions, tends to prevent bleeding, and reduces the tendency to retraction and adhesions.

      sodium nitrite in, iii. 126
      surgical intervention in, iii. 126

In the case of a projectile in an inflamed pulmonary area, P. Duval (Rev. de chir., li, 365, 1916) deems its extraction imperative. He effects a wide penetration of the pleura, with total pneumothorax, which does not present any particular danger when the cardiopulmonary apparatus is normal.

Petit de la Villéon (Bull de l'Acad. de méd., Paris, lxxv, 275, 1916) recommends usually his simpler procedure: The patient is placed under the screen, a buttonhole incision made over the foreign body, and a closed extracting forceps introduced and pushed in obliquely until it reaches the body. The forceps is then opened and the body seized and extracted. Neither pneumothorax nor hemothorax follows. In a subsequent paper (Presse méd., July 6, 1916) the same author reports uniform recoveries in 51 cases by his method.

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  scars, **thiosinamine** in, viii. 530
  sebaceus or superficialis, see Lupus Erythematosus, viii. 630
  suppurating, **europhen** in, iv. 709
  verrucosus, viii. 628
  vorax, viii. 628
  vulgaris, viii. 627

Jacobson (Nederl. Tijdsch. v. Geneesk., Feb. 26, 1916) to cover the diseased area, takes a cast of the face, and has a copper mold made. Hard gelatin is then mixed with twice its weight of glycerin, a little water, and quinine as a preservative, tinted to match the complexion; this is heated, poured in, and sets in a few minutes, thus providing an artificial nose, ear or cheek, light and elastic, to be stuck to the face with putty varnish. It can be melted, and a new one made in a few minutes.

    acetic acid in, i. 230

A. Reyn (Trans. xi, No. Surg. Congr., Goeteborg, July, 1916; Surg., Gynec. and Obstet., Dec., 1916) states that of 72 old and chronic cases of lupus vulgaris treated with carbon arc lamp light, 52 were cured; 15 markedly improved; in 3 the result was not known; and in 2 slight improvement occurred. He also uses the **Finsen rays**, as only thus will the nodules disappear entirely.

    Bier's hyperemia in, v. 599; viii. 630
    Boeck's paste in, viii. 629
    carbon dioxide, solid, in, viii. 629
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    cold compresses in, viii. 629
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  gonococcal or syphilitic, see Bubo, under Syphilis: General Infection, viii. 458; also this Index.
  tuberculous, **calcium creosote** in, iii. 687
  tuberculin in, ii. 390

In tuberculous lymph glands, A. F. Holding (Med. Rec., Mar. 11, 1916) urges that non-surgical methods should first be tried in all cases, including the **X-rays**, which have proven successful in 1500 cases, and **deep hyperemia** and **tuberculin.** The best results from the rays are obtained in the advanced caseous lesions or where sinuses have formed. The essentials of the deep therapy are the use of the Coolidge tube, high voltage, measured maximum skin dosage, cross-firing, and filtration of the rays, given in 3 to 10 series of treatments.

W. O. Ladd (Med. Rec., June 17, 1916) asserts that in 70 to 80 per cent. of cases the portal of entry is the tonsil, and believes it illogical to **remove the glands without the tonsils.**

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Lymphadenoma, viii. 544
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ligation of main artery in, viii. 544
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In 6 cases of lymphangioma, in which 2 were of the neck, 3 of the tongue, and 1 of the leg, **radium** gave excellent results in the hands of Robert Abbe (Med. Rec., Aug. 7, 1915).

Two case of lymphangioma circumscriptum were successfully treated with **radium** by F. E. Simpson (Jour. Amer. Med. Assoc., Mar. 25, 1916). Radium varnish applicators of ¼ strength were usually employed. Four such applicators covering an area of 16 sq. cm. being applied, unscreened, for 1 hour a day on 4 successive days. Four similar courses about 4 to 6 weeks apart sufficed.

Lymphangioma (*continued*).
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of stomach, viii. 395
hypertrophicum, viii. 544
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ichthyol in, viii. 542
incision, free, in, viii. 542
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limb to be elevated and kept quiet and warm in, viii. 542
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Mercury succinimide, 1 to 1½ grains (0.06 to 0.10 Gm.) hypodermically, is advised by B. L. Wright (Med. Rec., July 11, 1914). It should be repeated 2 or 3 times within 2 or 3 days, if necessary.

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  radium in, viii. 545

In a series of 20 cases of lymphosarcoma treated with **radium** by Kelly and Burnam (N. Y. Med. Jour., Feb. 5, 1916), 13, or 65 per cent., were apparently cured. The amounts used varied from 441 mg. to 2000, distributed over different areas for several hours, and repeated at intervals of weeks or months. Primary extensive lymphosarcoma of the mediastinum responded with just as much readiness.

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Magendie's solution, vii. 175
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Magnesium hypochlorite is prepared by Mayer (Paris méd., Feb. 19, 1916) by dissolving 190 Gm. (6⅓ ounces) of magnesium sulphate in 2 liters (quarts) of water and mixing this with 2 liters (quarts) of water into which 100 Gm. (3⅓ ounces) of chlorinated lime have been stirred. The precipitate is allowed to settle and the clear fluid decanted, ready for use.

M. Dubard (Bull. de l'Acad. de méd., Aug. 22, 1916) points out that magnesium hypochlorite is practically non-irritating, though strongly bactericidal, and its concentration can be varied more readily than with Dakin's solution. It should be freshly prepared before use. In *wounds* it proved far superior to Dakin's fluid. Its use in *obstetrics* is also advised.

W. J. Robinson (Med. Rec., Jan. 27, 1917) recommends magnesium sulphate, 20 to 40 Gm. (5 to 10 drams) in water once or twice a day, as an efficient *anaphrodisiac* having none of the objectionable features of potassium bromide.

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Magnesium-nitric test for albumin, i. 502
Magnetic wave currents, iv. 428
Maidism, see Pellagra, viii. 575
Maisonneuve's caustic arrows, see Zinc Chloride, viii. 833, 834
Mal de cour, see Hook-worm, vii. 310
Mal de los Pintos, see Pinta, vii. 475
Malacia, viii. 340
Malar bones, fractures of, iv. 761
Malarial fevers, vi. 477

Diagnosis, vi. 493, 506.—The value of thick smears in the diagnosis of malaria is demonstrated by H. A. Taylor (Jour. Amer. Med. Assoc. Mar. 10, 1917). The thick slides are dehemoglobinized by immersion for 1 to several hours in 70 per cent. alcohol containing 2 per cent. of hydrochloric acid. They are stained by a modified Giemsa stain, from which glycerin is omitted.

Methods are described by Dudgeon and Clarke (Lancet, Apr. 7, 1917) by which they cultivated the plasmodia of the malignant estivoautumnal form and to a less extent of the tertian. They were thus enabled to make positive diagnoses where careful blood examination had failed.

Pathology, vi. 502.—In certain pernicious malarial paroxysms, Paisseau and Lemaire (Bull. de l'Acad. de méd., Oct. 17, 1916) noted signs of adrenal involvement, such as low blood-pressure without disturbance of cardiac rhythm, vomiting, diarrhea, lumbar and abdominal pains, and the white line phenomenon. In 3 autopsies marked adrenal changes were found. Mild involvement possibly occurs in the ordinary paroxysms, and in some chronic cases. **Epinephrin** is indicated in algid cases.

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optochin in, vi. 527
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Treatment, vi. 516.—In debilitated patients and in hemoglobinuric fever A. D. McLean (U. S. Naval Med. Bull., Apr., 1917) gives **quinine** intravenously in concentrated solutions, *e.g.*, in 10 to 15 c.c. (2½ to 3¾ drams) of fluid.

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argentarsyl in, vi. 529

A mixed treatment of malaria is recommended by Ravaut and Kerdrel (Presse méd., Mar. 15, 1917), consisting of 10 intravenous injections of 0.15 to 0.3 Gm. (2½ to 5 grains) of **novarsenobenzol** every 3 days, and in the intervals, **quinine** intravenously or by mouth. In 53 patients the first treatment uniformly stopped all paroxysms. Good results were also obtained in malarial hematuria and hematemesis.

Armand Gautier (Bull. de l'Acad. de méd., Apr. 24, 1917) asserts that as little as 0.5 Gm. (7½ grains) of **quinine hydrochloride,** given with 0.05 to 0.1 Gm. (¾ to 1½ grains) of **arrhenal,** will cure the most rebellious forms of malaria. The 2 drugs should enter the blood together in 6 or 7 doses before a paroxysm. The arsenicals, in reinforcing quinine (or mercury), probably act through activation of phagocytosis.

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iodine in, vi. 526
Lugol's solution in, vi. 526
mercurial plaster in, vi. 672

Mercuric chloride intravenously in malaria is advised by N. Barlow (Amer. Jour. of Trop. Dis., Mar., 1916). Ten c.c. (2½ drams) of the solution he uses represent ⅛ grain (0.008 Gm.) of mercuric chloride. When there are but few parasites, mercury usually causes complete sterilization at the first injection. Quinine should be given daily, and an injection of mercury of ¼ grain (0.016 Gm.) for each 150-pound weight at intervals of 1 week.

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In chronic malaria as met with in Great Britain, James Cantlie (Jour. of Trop. Med. and Hyg., Jan. 15, 1917) believes in combining quinine with arsenic, opium and calomel. He gives a pill of **quinine hydrochloride,** 3 grains (0.2 Gm.); **arsenic trioxide,** 1/24 grain (0.0025 Gm.); compound soap pill (B. P.), 1 grain

(0.065 Gm.), and **calomel**, 1/12 grain (0.005 Gm.), to be taken twice daily for a week, then once daily.

aniline dyes in, vi. 515
canopies in, vi. 515
carbolic acid (crude) in, vi. 515
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screening in, vi. 514, 516
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Malarial headache, **eucalyptus oil** in, iv. 706
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H. Vincent (Presse méd., Jan. 27, 1916) states that he has established the efficacy of 3 or 4 Gm. (45 to 60 grains) a day of **calcium chloride** in warding off and treating hemoglobinuric bilious fever.

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jaborandi in, vi. 571
malt extract in, vi. 570
mammary gland substance in, i. 795
massage in, vi. 570, 571

In cases of recent delivery in which the supply of milk is quickly

diminished, C. H. Duncan (N. Y. Med. Jour., Jan. 6, 1917) injects 1 c.c. (16 minims) of the **mother's own milk** subcutaneously, under strict asepsis. This is repeated in 2 days, and, if necessary, in 5 days again. Under ordinary conditions, results are certain.

- **nutritious food** in, vi. 570
- **pilocarpine** in, vii. 471
- **strychnine** in, vi. 570
- **thymus** in, i. 790
- **thyroid gland** in, vi. 571; i. 744

anomalies, vi. 539
- micromazia, vi. 539
- polymastia, vi. 539

calcification, vi. 550

carcinoma, vi. 554

Diagnosis, vi. 557.—The average age of 962 patients with carcinoma of the breast, according to MacCarty and Mensing (St. Paul Med. Jour., May, 1916), was 47.9 years, in comparison with an average of 40 years, in 406 patients with simple chronic mastitis. Of all cases of chronic mastitis 37.3 per cent. were diagnosed correctly by the clinician, the other 62.7 per cent. depending on fresh tissue diagnosis. Chronic mastitis is always present.

Complications.—Polyuria was noted by Sekiguchi (Annals of Surg., Mar., 1916) in the last stage of breast cancer in 2 cases, due to metastasis in the posterior lobe of the hypophysis.

inoperable cases, vi. 566

In inoperable cases, C. W. Strobel (Med. Rec., Aug. 12, 1916) uses a method consisting of 4 stages: **Denudation, removal, skin grafting,** and finally, **lymphangectomy, radium** and the **X-rays.** In the first stage all the skin layers, with the fascia and nipple, are destroyed with crayons of **potassium hydroxide.** In the second, all mammary and adjacent infected tissues are destroyed and removed with a compound of **zinc chloride, sanguinaria root,** and **willow charcoal.** The grafting is done with skin from the thigh.

J. P. Warbasse (L. I. Med. Jour., Dec., 1916) protests against regarding as inoperable cases with extension along the axillary vessels and nerves, causing swelling, pain, and numbness in the arm. In such cases the operation should begin with amputation of **the shoulder,** the **scapula and clavicle** being removed without hesitation. An involved rib or ribs may be removed, likewise the pleura or a pulmonary lobe, the internal jugular and carotids, and the brachial plexus, vagus, and phrenic nerves. The only structures which must be preserved are the heart, aorta, and vena cava.

- **alcohol injections** in, i. 538; vi. 566
- **atropine** in, vi. 566
- **belladonna extract** in, vi. 566
- **boric acid** in, vi. 566
- **chloretone** in, vi. 566
- **lead acetate** in, vi. 566
- **morphine** in, vi. 566
- **movements of arm restricted** in, vi. 566
- **opium extract** in, vi. 566
- **radium** in, vi. 567; viii. 829
- **relief of pressure** in, vi. 566
- **salicylic alcohol solution** in, vi. 566
- **sodium cacodylate** in, ii. 701
- **thyroid gland** in, vi. 567
- **X-rays** in, vi. 567

operable cases, vi. 558
- **beta-eucaine anesthesia** in, iv. 702

In operating in breast carcinoma, J. F. Percy (Tr. West. Surg. Assoc., Dec., 1916) strongly recommends that all bleeding be arrested by the **cautery knife,** which kills the vascular cancer nidus in its incipiency. An X-ray picture should be made, and if metastasis into the lung, pleura, or ribs is disclosed, massive doses of **X-ray** should be given by an expert. Gauze dissection in the axillary space is condemned.

- **cocaine cataphoresis** in, iii. 499
- **extirpation** in, vi. 558-566
- **Halsted's operation** in, vi. 563

Pilcher (Annals of Surg., May, 1917) advises routine **removal of the supraclavicular glands** at the primary operation.

- **intravenous anesthesia** in, iv. 688
- **novocaine anesthesia** in, vii. 103

Mammary gland (*continued*).
  cirrhosis of, **chromium sulphate** in, iii. 338
  cystic disease, see Mastitis, Chronic Cystic, vi. 552, and also this Index.
  cysts, vi. 550

In all doubtful cases F. J. Shepherd (Annals of Surg., Aug., 1916) introduces a needle. If it is a cyst, **evacuation of the fluid** causes disappearance; if it is a solid growth, it remains. If the fluid is clear he has no doubt of non-malignancy; if bloody, the case is operated on.

  dermoid cyst, vi. 551
  diseases of, vi. 539
  encephaloid carcinoma, vi. 556
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    atropine in, ii. 444
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  inflammation of, see Mastitis, vi. 542, and also this Index.
  intracanalicular myxoma, vi. 550
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    excision in, vi. 550
    potassium iodide in, vi. 550
  lipoma, vi. 550
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    potassium iodide in, vi. 550
    pressure in, vi. 550
  organotherapy, i. 794
  osteoma, vi. 548
  papilloma of.

A hemorrhagic or serohemorrhagic discharge from the nipple in the absence of a palpable tumor seems to be most often produced by benign intracanalicular papillomas. In view of this fact, according to E. S. Judd (Journal-Lancet, Mar. 1, 1917), treatment should be conservative, especially in young women. In older women, particularly if there is chronic cystic mastitis, **removal of the gland** is indicated.

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  scirrhous carcinoma, vi. 555
  serous cyst, vi. 551
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    iodine injection in, vi. 551
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    chloral hydrate in, iii. 209
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    codliver oil inunctions in, iii. 512
    sea-water solution in, viii. 188
    spermin in, i. 785, 786
  infantile, light therapy in, vi. 361
    malt extract in, vi. 537
    thyroid gland in, i. 714

In some cases of marasmus, according to Raimondi (Presse méd., Jan. 8, 1917), the internal secretions are at fault. The thymus, hypophysis, thyroid, parathyroids, or suprarenals may at first function inadequately, and giving the corresponding extract will tide the infant over this period. In insufficiency of the thymus, the bones are softer, exhaustion, ulceration and purpura are common, as also loss of flesh and lack of resistance to infections. The infants benefiting from thyroid treatment are small with dry or puffy skin and lids, the face waxy, mental torpor, the skeleton and teeth backward, possibly eczema, and an overlarge tongue. Thyroid instability is also suggested when in babies small at birth, the bones and muscles remain small, the hair and teeth develop poorly, and there is difficulty in sitting up or holding up the head.

Marble leg, see Phlegmasia Alba Dolens, viii. 802
Marsh fever, see Malarial Fevers, vi. 477, and also this Index.
Marshall's method for urea, viii. 674
Martin's anal speculum, v. 442
Martin and O'Brien's antidote to hydrocyanic acid, v. 562
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    removal of breast in, vi. 543
  chronic cystic (cystic disease), vi. 552
    surgical removal in, vi. 553

In operating upon chronic cystic mastitis, according to D. Lewis (Can. Lancet, Oct., 1916), **removal of all the glandular structure** is most easily accomplished by making an incision to the inner side of the nipple, cutting the milk ducts at their entrance and removing the glandular portion with traction. The breast can then be reconstructed by placing several purse-string sutures through the fat and tying from below upward. Usually the diagnosis of malignancy or benignancy can be based on gross examination.

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    abscess caviety washed in, vi. 547, 548
    adhesive straps in, vi. 547
    alcohol in, i. 533; vi. 547
    ammonium chloride in, i. 621
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Mastoid cases, unhealed, bacterial vaccines in, ii. 429
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Mastoiditis, acute.

Symptoms.—These comprise severe pain in the mastoid region, tenderness, fever, and usually swelling of the auditory meatus above and posteriorly. Where a discharge from the meatus in acute otitis suddenly stops and remains in abeyance for more than a few days, mastoiditis requiring operation is likely to develop.

Etiology.—Tuberculosis, syphilis, or trauma of the mastoid may induce an apparently primary mastoiditis, in which, if caries of the bone occurs, the abscess cavity is generally not connected with the tympanum. Almost always, however, mastoiditis in any of its forms is a consequence of pre-existing acute or chronic suppuration of the middle ear.

Prognosis.—In the most acute cases, usually streptococcic, only a few days may separate the initial symptoms and the moment at which surgical evacuation of the mastoid becomes indicated. In other cases slight tenderness on deep pressure and mild shooting pains through the mastoid may persist for weeks, and operation remain unnecessary, a fluctuating swelling finally appearing over the mastoid or the digastric fossa, or more deeply in the neck tissues, the result of perforation of the bone and passage of pus into the soft tissues. Tenderness of the mastoid occurring in the course of acute suppurative otitis media will usually soon disappear under treatment. In cases later in advent, recovery will occur in the majority of cases without operation provided streptococci or the influenza organism are not causative and provided the postero-superior tissues of the auditory canal are not inflamed. Occasionally, however, mastoid disease extends inward and causes lateral sinus phlebitis, thrombosis, and embolism. Subdural abscess, basal or otherwise situated meningitis, and brain abscess are also possible complications. .

Diagnosis.—A pushing out of the auricle from the head, when viewed from behind, is deemed significant of mastoiditis, enlargement of the small lymph node over the surface of the mastoid not causing this condition. A bacteriologic examination of the discharge should be made, as the type of organism found governs the urgency of operative treatment. The X-rays are of diagnostic value, serve to show the size and extent of the mastoid cells in the individual case, and assist in convincing the patient of the necessity of an operation, where indicated.

Treatment.—Pain may be combated with a **hot water bag** or **ice-bag**, and if necessary an analgesic drug given. Hourly irrigations with 1:5000 **hot bichloride solution** and **Bier's hyperemia** with a constricting band around the neck 4 times a day, with 2-hour intervals between treatments, have also been recommended. **Shrapnell's membrane** should be **incised** when its posterior part, together with the surrounding meatal tissues are found congested, and a 20 per cent. **ointment of ichthyol** in wool-fat may with advantage be applied over the mastoid.

Operative treatment is indicated where the above measures, coupled with proper management of middle ear suppuration, fail to give relief. Where some doubt as to its necessity exists, it seems wise to incline toward the intervention, both the danger to life and that of loss of hearing being greatly reduced by the operation, which in itself entails but slight risk.

The customary operative procedure is the simple mastoid or **Schwartze operation.** The incision is made from the tip of the mastoid to a point above the helix, and passes rather close to the auricular attachment. It is continued upward almost to the temporal artery, and should penetrate to the bone, the periosteum being cut through. The lips of the wound may be held apart with Jansen dilators above and below, after the periosteum has been carefully raised for some distance. The cortex of the mastoid, if softened, is then rather easily removed with bone forceps or curette, and any abscess cavity found scraped clean down to normal bone with the curette, special care being taken at the points where the lateral sinus and aqueduct of Fallopius might be injured. The mastoid antrum should then be thoroughly opened up and the bone above and behind the meatus, at roof of the zygoma, chiselled away to obviate sinus formation from cells overlooked in this locality. In cases of von Bezold's abscess, due to perforation toward the midline on the inner surface of the mastoid process, the whole tip of the mastoid should be removed and the underlying abscess cavity well opened up. In cases in which the mastoid, upon exposure, shows no area of softening or sinus opening, entrance into the mastoid is effected with a chisel and mallet, in a safety space called triangle of Macewen or suprameatal triangle, bounded in front by the posterior wall of the meatus, above by the linea temporalis, and behind by the remains of the squamomastoid fissure. The antrum will be penetrated at a depth of 12 to 22 millimeters from the surface, the operator proceeding with great caution in the latter part of this distance. Upon working in a direction slightly upward and parallel to the auditory canal, a right-angled probe, passed into the vault of the tympanum through the meatus, will eventually be encountered, with relative safety. The wound and meatus are then thoroughly cleaned with warm sterile water, and the former allowed to fill with a blood-clot (in absolutely clean cases only) or prepared for healing by the open method.

Harold Hays (N. Y. Med. Jour., Nov. 11, 1916) asserts that in cases which do not respond to treatment, and where sinus thrombosis and epidural abscess are set up, the X-rays frequently determine the condition of the underlying bone before extensive destruction has taken place.

If, in acute mastoiditis, one can maintain good drainage through the drum, many cases may be aborted, according to J. W. White (Va. Med. Semi-Mthly., Mar. 9, 1917). The canal should be examined daily, and if there is the slightest pus retention, several **myringotomies** should be done if needed, and the **canal irrigated** with some hot solution every 2 or 3 hours. In the aged, however, in acute mastoiditis superimposed on a chronic middle ear suppuration, immediate **operation** is indicated. If pain persists, although there is good drainage from the ear, operation is called for. If headache is severe, a **lumbar puncture** should be done. The smouldering cases with streptococcus mucosus capsulatus infection should not be watched longer than 3 weeks.

Middle-ear involvement which does not resolve in 2 weeks means, according to E. B. Dench (N. Y. Med. Jour., Mar. 18, 1916), mastoid disease demanding at least exploratory operation. Tenderness after the fourth or fifth day is of great significance, especially if over the antrum. Narrowing of the external auditory meatus near the drum, is the most reliable sign of all. The drum membrane may appear nearer to the entrance of the canal than normally. General symptoms of diagnostic importance are persistent hadache and sleeplessness. Absence of temperature and the differential blood-count are relatively unimportant. Recurring attacks of acute otitis point to mastoid involvement.

Irrigation with **Dakin's solution** and **drainage** according to Carrel's technic are urged by Mahu (Presse méd., Apr. 5, 1917), for a period before closing the wound after operation for acute mastoiditis. One or 2 teaspoonfuls of Dakin's fluid are used for irrigation every 2 hours, under a pressure of 60 or 80 centimeters. When the germs in the discharge are reduced to 1 per microscopic field, he sutures the wound entirely. Complete healing is thus obtained in one-third the usual time.

Bier's hyperemia in, v. 596, 597
leeching in, vi. 314
light therapy in, vi. 360

chronic.

Symptoms.—At times there is little or no pain. The condition may not be suspected until examination reveals congestion of Shrapnell's membrane, associated with postero-superior swelling in the meatus. Enlargement over the mastoid or of the tissues below the ear may, however, suggest the condition from the exterior. Where perforation has occurred, the typical pushed-out appearance of the auricle will be noted on posterior inspection.

Pathology.—Usually the mastoid antrum is occupied by cholesteatomatous masses, *i.e.*, accumulations of epithelial scales, dried pus, and cholesterin crystals. These masses are apt to shut off the mastoid cells from the tympanic cavity. Almost complete obliteration of the cells may also result from thickening of the tissues adjoining a carious portion of the bone. Where no suppuration has occurred in the preceding active inflammation, consolidation of the mastoid by hyperostosis may be induced in the absence of bone caries.

Treatment.—The Schwartze or simple mastoid operation often fails to completely cure the condition where there has been chronic suppuration. In 1891 **Stacke** introduced the radical mastoid **operation**, which, as at present performed, aims to throw together into a single cavity the mastoid cells and antrum, the middle ear, and the auditory canal, after thorough removal of all diseased tissue. The antrum is first opened as in the simple mastoid operation, and the cartilaginous portion

of the canal with the periosteum separated from the bony canal by elevation, incision, and traction. The bony canal is now chiselled off down to the annulus tympanicus, care being taken not to endanger the facial nerve. The bony external wall of the attic and aditus is then gouged and curetted off, the tendon of the stapedius muscle and the incudostapedial articulation severed, and removal of the malleus and incus affected. The external walls of the antrum, attic, and hypotympanic space are next curetted away to eliminate projecting bony margins and round out the cavity as a whole. Finally, oozing is checked, and as much as practicable of the cavity remaining lined with flaps of skin from the meatus and the concha. The uncovered area is permitted to heal by granulation or grafted at the operation or later with Thiersch grafts. Behind the auricle the periosteum is first sutured, then the subcutaneous tissues and skin. Through the enlarged meatus a small cigarette drain is inserted and a gauze dressing applied. A paste composed of scarlet red, 1 part, and Beck's paste, 3 parts, has been suggested by Myles for use in the after-treatment. Harris in 1917 pointed out that improvement in hearing from the radical operation cannot be promised. Where the disease is limited to the antrum and mastoid cells the simple operation should prove sufficient.

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Matas's method in aneurism, i. 679, 680
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May-apple, see Podophyllum, vii. 566
Mayo's operation for gastrectomy, i. 50
  technique in hernia, v. 458, 488, 489, 490
    in vaginal fistulæ, viii, 772
McBurney's incision, ii. 105, 106
McGavin's technique in hernia, v. 472
McGraw ligature, i. 37
McMunn's elixir, vii. 173
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  blood-picture in, v. 383
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    arsenic in, vi. 585
    avoid exposure to disease in, vi. 585
    cleanliness in, vi. 585
    disinfection of attendants in, vi. 585
    eucalyptus oil neck-bags in, vi. 585
    gowns, caps, etc., in, vi. 585
    isolation and quarantine in, vi. 585

Quarantine and observation of contacts for 14 days from the date of the last exposure to the original case is advocated by Whyte (Can. Pract. and Rev., Aug., 1916) as the only effective measure in preventing the spread of measles from house to house. Prolonged quarantine of the original infecting case is probably unimportant.

    salvarsan in, vi. 585
    school closure in, vi. 585
    ventilation (free) in, vi. 585
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    acetphenetidin in, vi. 586
    aconite in, i. 283
    alum lotion in, vi. 587
    avoid exposure in convalescence, vi. 588
    borax-glycerin in, vi. 587
    boric acid in, ii. 585; vi. 586
    brown mixture in, vi. 586
    camphorated oil in, ii. 729
    cleansing and care of eyes in, vi. 587
    cold cloths in, vi. 586
    cold cream in, vi. 586
    cold sponging in, vi. 586

In malignant measles Longin and Camuset (Presse méd., Feb. 10, 1916) recommends prompt intravenous injection of 0.5 to 1 c.c. (8 to 16 minims) of **colloid gold.** The condition returns to that of an ordinary mild case.

    creosote in, iii. 687
    darkened room in, vi. 586
    diet in, vi. 586

Eleven cases of measles were treated by Hirschfelder and Schultz

(Amer. Jour. Dis. of Children, May, 1916) with ethylhydrocupreine in capsules, in doses of 0.1 to 0.5 Gm. (1½ to 7½ grains), 3 times a day. The acute symptoms showed an average duration of 4.3 days, while among 10 unselected cases without the treatment it was 8 days. All the treated cases were free from complications; in the untreated there were several severe complications.

eucalyptus oil in, vi. 587
even temperature (65° F.) in, vi. 587
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phosphorus in, vii. 455
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carcinoma of, viii. 551
chondroma of, viii. 551
cysts of, viii. 551
fibroma of, viii. 551
foreign bodies of.

In cases of foreign bodies from the mediastinum, experience has convinced Le Fort (Bull. de l'Acad. de méd., Nov. 28, 1916) that the best route of extraction is usually, both for the anterior and posterior mediastinum, through the pleura anteriorly. He makes a flap with external base comprising generally 3 ribs. Inspection and palpation from sternum to spinal column are thus easily feasible. The resulting pneumothorax is easily withstood. Foreign bodies were removed from behind the heart and in contact with the great vessels in 12 cases, all recovering. A complete X-ray examination should always precede.

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Mediotarsal joint, amputation at, vii. 802
Mediterranean fever, see Malta Fever, vi. 537, and also this Index.
Megaloblasts, or macroblasts, v. 382
Megalocytes, or macrocytes, v. 382
Meiostagmine reaction in cancer, ii. 775
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    anhalonium Lewinii in, i. 700
    blood-pressure in, ii. 499
    caffeine in, iii. 525
    cannabis indica in, iii. 6
    chloralformamide in, iii. 214
    cimicifuga in, iii. 345
    coca in, iii. 481
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    kino in, vi. 236
    orchitic extract in, i. 785
    potassium iodide in, vi. 23
    strychnine in, vii. 147
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  stuporous, **thyroid gland** in, i. 742
Melanemia, in acute malaria, vi. 502
Melanoma, ii. 760
Melanosarcoma, **adrenalin** in, i. 771
Melanuria.

The urine in cases of melanotic tumor at times contains melanogen, which upon standing or addition of oxidizing substances or alkalies changes into melanin, causing a blackish discoloration. Upon addition of ferric chloride, intensification of the shade may occur, or a black precipitate result which will dissolve in a solution of sodium carbonate. From this solution mineral acids will reprecipitate it. The black pigment may also occur in chronic malaria.

Melena, **emetine hydrochloride** in, vi. 60
  neonatorum, vii. 35

A case of **blood transfusion** by the **citrate method** in a 60-hour old baby with melena, is reported by H. Woltmann (Jour. Amer. Med. Assoc., Dec. 18, 1915), 60 c.c. (2 ounces) of blood being injected. Recovery was uneventful. To 10 c.c. (2½ drams) of sterile 2 per cent. sodium citrate solution were added 100 c.c. (3⅓ ounces) of blood from a vein in the father's arm.

Melena neonatorum (*continued*).
    gelatin in, v. 15, 16
  of typhoid fever, **turpentine** in, viii. 635
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    aconite in, i. 284
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    phosphorus in, vii. 455
    salvarsan in, iv. 214
    venesection in, viii. 804
  cerebrospinal, vi. 617
    prophylaxis, vi. 633

In soldiers' barracks in Zürich, according to Petruschky (Münch. med. Woch., Sept. 27, 1915), after certain prophylactic measures had been enforced new cases still occurred; but after careful attention to handkerchief disinfection no new cases appeared. Examination of the nasal cavities of cavalry horses by L. Mazzetti (Riforma méd., May 29, 1915) showed many to be carriers of meningococci.

According to Rosenthal and Cheville (Paris méd., June 24, 1916), epidemic meningitis starts in adenoids. In convalescents they **inject** daily **through** the **nostrils** a **medicated oil** mixed with equal parts of **antimeningococcus serum**, the patient being as yet infected, not a mere carrier.

To rid the nasopharyngeal regions of the meningococcus in carriers Gordon and Flack (Brit. Med. Jour., Nov. 18, 1916) recommend **steam nebulæ medicated with chloramine.** One to 2 per cent. solutions of this substance were used, and 1 liter (quart) of the solution liberated in a period of 20 minutes into a room of 750 cubic feet capacity, the patient

practising deep inhalations through the nose. Sterilization was secured after 4 to 13 daily exposures. On hot summer days **zinc sulphate nebulæ** proved less irritating.

Pizzini (Policlinico, May, 1917) detected a connection between body lice and meningitis in 2 recent epidemics. In prophylaxis he urges measures to eradicate lice, with isolation of the patient until meningococci are no longer found in the blood.

treatment, vi. 628
  antimeningococcic serum (Flexner's) in, vi. 438, 628-631

From experiences with cerebrospinal meningitis Neveu-Lemaire (Bull. de l'Acad. de méd., Apr. 18, 1916) advises beginning spinal injections of **antimeningitis serum** as soon as possible, giving 40 to 50 c.c. at the start, and repeating them several times a day at first, especially in grave forms. Hot baths at 39° C. or 40° C. (102.2° F. or 104.0° F.) were given as an adjunct measure. In 33 cases the mortality was thus reduced to 1 case, or 3.1 per cent.

  aspiration of lateral ventricles in, vi. 629
  Bier's hyperemia in, v. 594, 596
  calomel in, vi. 633
  codeine in, vi. 633
  cold pack in, vi. 633
  cold soap-suds enema in, vi. 633
  cupping in, vi. 633
  cytology of cerebrospinal fluid in, vi. 620
  diet in, vi. 633
  gelsemium in, v. 18
  hexamethylenamine in, v. 531
  hot baths in, vi. 630, 633
  ice in, vi. 630, 633
  intracranial injections in, vi. 631
  leeches in, vi. 633
  lumbar puncture in, vi. 438, 628

By daily **lumbar puncture,** withdrawing large amounts of fluid up to 100 c.c. at a time, Mühsam (Berl. klin. Woch., Nov. 27, 1916) reduced the mortality from 56 to 5 per cent.

Where upon **lumbar puncture** no fluid will flow, S. Neave (Lancet, Feb. 10, 1917) advises slow **injection** of small amounts of saline by gravity, followed by immediate removal, thus washing out inspissated pus, and after several repetitions permitting the flow of turbid spinal fluid.

  magnesium citrate in, vi. 633
  meningococcus vaccine in, ii. 373
  menthol in, vi. 633
  mercury bichloride injections in, vi. 679
  morphine in, vi. 630, 633
  raising foot of the bed in, vi. 630
  scopolamine in, vi. 633; viii. 103
  sodium bromide in, vi. 633
  sulphur baths in, vi. 633
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  change of air in, vi. 633
  codliver oil in, vi. 633
  diet in, vi. 633
  electricity in, vi. 633
  Fowler's solution in, vi. 633
  hypophosphites in, vi. 633
  massage in, vi. 633
  sea salt bathing in, vi. 633
  sodium iodide in, vi. 633
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  acetphenetidin in, vi. 598
  blisters in, vi. 598
  cold baths in, vi. 599
  cold sponging in, vi. 598
  darkened room in, vi. 598
  diet in, vi. 598
  elevation of head in, vi. 598
  ethylhydrocupreine in, vi. 600
  guaiacol in, vi. 599
  hexamethylenamine in, vi. 599
  hydrochloric acid in, vi. 599
  ice in, vi. 598
  iodides in, v. 196
  leeches in, vi. 598
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  mercurial inunction in, vi. 599
  opening the labyrinth in, vi. 598
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  serum therapy in, vi. 599
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  vaccine therapy in, vi. 599, 600
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  externa, v. 195
  hypertrophic, vi. 601
  interna, v. 195

Meningitis, pachymeningitis, interna (*continued*).
    removal of clot in, v. 195
    trephining in, v. 195
  pneumococcal.

In a severe case of pneumococcal meningitis, A. C. Brown (Lancet, Sept. 16, 1916) had excellent results from the use of a stock **pneumococcus vaccine.** Lumbar puncture showed a thick, opaque fluid with pneumococci. In all, 5 doses were given, and complete recovery followed.

Walter Broadbent (Brit. Med. Jour., Oct. 28, 1916) reports several pneumococcal cases in children in which recovery took place from the giving of **Pane's pneumococcus serum** by mouth, on an empty stomach, in doses of 5 c.c. (1¼ drams) daily for the first 3 days, then on alternate days, and finally twice a week.

  serous, vi. 600
    iodine in, vi. 600
    mercury in, vi. 600
    surgical measures in, vi. 600
  spinal, vi. 600
    excess of fluid evacuated in, vi. 600
    laminectomy in, vi. 600, 601
    mercury in, vi. 601
    opening and washing theca in, vi. 601
  syphilitic, **salvarsan** in, iv. 213
  tuberculous, vi. 601

Retention of urine without any apparent cause is, according to Moody (Lancet, Jan. 1, 1916), a pathognomonic sign of primary tuberculous meningitis in the adult male.

    iodoform inunctions in, vi. 602
    lumbar puncture in, vi. 602; viii. 293
    potassium bromide in, vi. 602
    potassium iodide in, vi. 602
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Meningomyelorrhaphy, viii. 294
Menopause, vi. 643

According to Carey Culbertson (Surg., Gynec. and Obstet., Dec., 1916), there occurs in the majority of menopause cases a vacillating hypertension. The diastolic pressure is not elevated in proportion to the systolic, an increased pulse-pressure thus resulting. The hypertension is ascribed to relative oversufficiency of the hypophysis or adrenals. **Extract of corpora lutea** from animals in early gestation gradually restores the blood-pressure to normal.

  acetanilide in, i. 226
  asafetida in, vi. 646
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In the surgical menopause Hirst (Amer. Jour. of Obstet., Apr., 1916) found that while **corpus luteum extract** by mouth proved disappointing, intramuscularly good results could be obtained.

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  massage in, vi. 646
  opium in, vi. 647
  ovarian grafting in, vi. 647, 648; vii. 360
  ovarian substance in, i. 787; vi. 646, 647

In a case of premature menopause coming on after an attack of puerperal fever at 29, **pituitary extract** was begun by G. Jona (Gaz. degli Osped., Apr. 2, 1916) after 10 or 12 years, and soon menstruation returned, and general health improved.

  sodium salicylate in, vi. 647
  thyroid gland in, i. 751; vi. 647
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J. H. Wilmus (Lancet-Clinic, May 13, 1916) reports a case of recovery after intravenous injection of 7½ grains (0.5 Gm.) of **calcium sulphide** in 7½ ounces (225 c.c) of boiled and filtered water.

In a case with almost complete suppression of urine at least 24 hours before admission Cohen and Bernard (Jour. Amer. Med. Assoc., Apr. 1, 1916) applied the **Lambert and Patterson treatment**, viz., colonic irrigation, gastric lavage, and hot packs twice daily; continuous Murphy drips containing potassium acetate, 1 dram (4 Gm.) to 1 pint (500 c.c.) of water. The patient was also given by mouth 8 ounces (240 c.c.) of the following, every hour, alternating with milk: *Potassium bitartrate,* 1 dram (4 Gm.); *sucrose,* 1 dram (4 Gm.); *lactose,* ½ ounce (15 Gm.); lemon juice, 1 ounce (30 c.c.); boiled water, 16 ounces (480 c.c.). Recovery followed.

    egg and milk in, vi. 668
    emesis in, vi. 670

According to Lewis and Rivers (Bull. Johns Hopkins Hosp., July, 1916), retention of waste nitrogen is a factor in an early fatal issue. **Carbohydrates** are of great value in delaying this. If not retained by mouth, glucose may be given intravenously in a 10 to 50 per cent. solution.

    hot packs in, vi. 668
    hydrogen dioxide in, vi. 670
    hydrogen sulphide in, vi. 670
    magnesium citrate in, vi. 671

Of 16 patients treated by E. Schisler (Jour. Mo. State Med. Assoc., Apr. 1, 1917), 11 recovered. Besides **milk,** eggs, saturated solution of **magnesium sulphate, salt-free diet,** and **sweating, magnesium oxide,** 30 to 60 grains (2 to 4 Gm.) was given 3 times daily with plenty of water. A tablespoonful of **olive oil** was given 3 times a day and **electric packs** applied where symptoms of suppression of urine arose.

    milk in, vi. 668, 670
    milk and brandy in, vi. 668
    nourishment by rectum in, vi. 667
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    phosphorous acid in, vi. 671
    pilocarpine in, vi. 668

The following treatment proved successful, according to H. B. Weiss (Jour. Amer. Med. Assoc., June 2, 1917) in 27 out of 28 cases. The **stomach** is first **washed** with 1 quart (1000 c.c.) of **milk** and the **whites** of 2 eggs, followed by **water. Magnesium sulphate,** 90 Gm. (3 ounces) in 200 c.c. (6⅔ ounces) of water is left in the stomach. A **soapsuds enema** is then given. In the absence of vomiting, or of medical aid for 3 hours, 1000 to 1500 c.c. (2 to 3 pints) of **Fischer's solution** is given intravenously. From 6 to 8 glasses daily of the following are then given:—

Potassium bitartrate and sugar, of each, 4 Gm. (1 dram); **sodium citrate,** 2 Gm. (30 grains), water 250 c.c. (½ pint), and lemon or orange juice to taste.

A **liberal diet** without excess of proteins is allowed, with **water copiously.** The Fischer's solution and bitartrate drink are controlled by the reaction of the urine, which should

be made alkaline to an alcoholic solution of methyl red. The drink is continued for 10 or 13 days.

- potassium citrate in, vi. 668
- renal decapsulation in, vi. 670
- saline instillation in, vi. 668
- silver (colloidal) in, vi. 670
- sodium bicarbonate in, vi. 671
- sodium phosphite in, vi. 671

Fantus (Jour. Labor. and Clin. Med., Sept., 1916) recommends immediate administration of a tablet of sodium phosphite, 0.36 Gm. (5½ grains), and sodium acetate, 0.24 Gm. (4 grains), or if not available: Sodium hypophosphite, 1 Gm. (15 grains); water 10 c.c. (2½ drams), and hydrogen peroxide 5 c.c. (90 minims).

- sodium thiosulphate in, vi. 670
- stomach-tube in, 668-670
- strychnine in, vi. 668
- sulphites in, vi. 670
- sulphur in, vi. 670
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  - pilocarpine in, vi. 684; vii. 472
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  soda, chlorinated, in, viii. 191
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As a substitute for salpingectomy or salpingo-oöphorectomy for chronic tubal and pelvic inflammations, J. O. Polak (Trans. Amer. Med. Assoc.; N. Y. Med. Jour., June 9, 1917), advocates excision of the infected fundus of the uterus with the infected tubes. This leaves sufficient healthy uterine body to preserve the menstrual function, and 1 or both ovaries to continue ovulation.

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The following powder is recommended by Unna (Berl. klin. Woch., Feb. 21, 1916):—

℞ *Sulphuris,*
Zinci oxidi .āā 2.5 Gm. (37½ gr.).
Magnesii carbonatis,
Talci āā, q.s. ad 50.0 Gm. (1⅔ oz.).
M.

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A daily morning **hot pack,** lasting 2 to 3 hours, is given by H. Mason Smith (Jour. Fla. Med. Assoc., Jan., 1916), and continued for 8 to 10 days. The diarrhea which follows the immediate withdrawal should not be checked. One ounce (30 c.c.) of **sodium phosphate** is given daily, until the desired depletion has been secured, and then 1 dose of **castor oil** given. A **single dose of morphine** early in the treatment may be required if there are signs of collapse. The treatment never has to be continued longer than 10 days.

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As a specific, Lambert recommends the following formula, which has been found effective by a large number of observers:—

℞ *Tinct. of belladonna* .... f℥ ij (60 Gm.).
Fl. ext. of xanthoxylon,
Fl. ext. of hyoscyamus .... of each f℥j (30 Gm.).

The treatment should be started by giving 4 compound **cathartic pills, 5** grains (0.3 Gm.), of **blue mass** and a **soapsud enema.** When catharsis begins 6 to 8 minims (0.36 to 0.5 c.c.) of the above mixture are given every hour. The dose is then increased 2 minims (0.12 c.c.) every 6 hours, until 14 to 16 minims (0.84 to 1 c.c.) are taken hourly or the patient begins to show toxic effects, when the mixture is stopped, resuming again in 8-minim (0.5 c.c.) doses hourly, when the toxic effects subside. **Morphine** is given besides the belladonna mixture, but only ½ or ⅔ of the dose which the patient has been taking, and in 3 equal doses at half-hour intervals. The bowels must be kept open. After about 30 hours, **strychnine, digitalis,** or **strophanthus** should be begun. This treatment removes the desire for morphine (also cocaine and alcohol) in about 5 days.

J. McIver and G. E. Price (Jour. Amer. Med. Assoc., Feb. 12, 1916), from 147 cases, concluded that the **Lambert method** without its free purgation was unsatisfactory. The use of belladonna is the least important part in it. The adoption of a fixed dose for all patients is undesirable. The best plan is a **gradual withdrawal,** combined with **free purgation,** sedatives of the coal-tar group and stimulants as required. In most cases no treatment gives permanent results. The patient should never be discharged in less than 3 months, and should seek a complete change of scene, occupation, and associates.

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According to J. E. Talley (Trans. Amer. Med. Assoc.; N. Y. Med. Jour., June 9, 1917), dangerous acid intoxication may arise during morphine withdrawal, and may be an element in sudden collapse. This may be avoided by giving enough **sodium bicarbonate** to keep the urine neutral before beginning the reduction of morphine.

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Mouth, carcinoma of, **ice** in, iii. 531

Stress is laid by J. S. Horsley (So. Med. Jour., ix, 512, 1916) on the harmfulness of excising a specimen and allowing time to elapse before operation is done. Excision of the specimen should be done with the cautery, and the complete operation

follow immediately. A wide dissection must be made, including a part of the jaw bone. The slow cautery is for massive recurrences.

G. E. Pfahler (Jour. Amer. Med. Assoc., Nov. 18, 1916) prefers **destruction of all affected tissues by electrothermical coagulation**, followed by prolonged treatment with full doses of penetrating X-rays applied both to the lesions and glands. The only place for **radium** is in lesions within the mouth as on the tongue, cheek, and inner aspect of the lip.

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Examination for chronic mouth lesions in over 700 cases by F B. Moorehead (Jour. Amer. Med. Assoc., Sept. 16, 1916) showed percentages of 69 to 89 per cent., mostly associated with previously treated root canals. In diagnosis the X-ray is paramount. The involvement of the peridental membrane is the crux in deciding between conservative and radical treatment. Faulty root-canal technic, careless use of arsenic, and irritating drugs in treating root canals strongly predispose to chronic alveolar abscess. Processes of repair should be checked up by frequent röntgenograms. Removal of infection is imperative, whether the patient is well or ill.

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  hydrogen dioxide as, v. 571
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According to experiments of H. P. Goodrich (Brit. Med. Jour., Apr. 14, 1917), a saturated aqueous solution of **thymol**—0.05 per cent.—is a very good antiseptic for ordinary mouth bacteria.

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  dystrophy, vi. 756

Of 7 living members of a family showing a somewhat atypical form of progressive muscular dystrophy, resembling Erb's infantile type, benign and slow in progress, 4 showed distinct X-ray changes in the pineal gland, according Timme (Arch. of Internal Med., Jan., 1917). A fifth showed an enlarged sella turcica. Pineal disturbances probably play an important rôle in the pathogenesis of progressive muscular dystrophy.

    avoidance of exertion in, vi. 760
    electricity in, vi. 760
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In a typical case of progressive muscular dystrophy McCrudden and Sargent (Arch. of Internal Med., Apr., 1916) found that treatment which increased the glucose and cholesterin content in the blood led to clinical improvement.

    massage in, vi. 760
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Mutism.

A case of hysteric mutism in a soldier, lasting over 6 months, is reported by Saraceni and Bonelli (Gaz. degli Osped. e della Clin., Mar. 11, 1917). It resisted hypnosis at first, but finally yielded to a second use of this measure an hour and a half in duration.

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    - strychnine in, viii. 344
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    The thymic tumors occurring in myasthenia gravis, states Bell (Jour. Nerv. and Mental Dis., Feb., 1917), seem to form a distinct group. They may be classified as a benign thymoma. Some thymus abnormality is found in nearly half the cases of myasthenia gravis.

    - arsenic in, vi. 749
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    - galvanization, central, in, vi. 749
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    - ovarian extract in, vi. 750
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- Mycetoma, see Madura Foot, vi. 467, and also this Index.
- Mycosis of the Pharynx, see Pharynx, Mycosis of, vii. 426
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    - good food in, vi. 776
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    - thymol iodide in, vi. 776
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- Mydriasis, atrophic, or paralytic, physostigmine salicylate in, vii. 460
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- Myelitis, viii. 231

    During the war G. Etienne (Bull. de l'Acad. de méd., Jan. 30, 1917) has seen 12 cases of acute myelitis of the epidemic Heine-Medin type. Ten occurred in a compact, epidemic group. The conditions manifested included diffuse myelitis, fatal ascending myelitis of the Landry type, and transverse myelitis, varying greatly in intensity. Of the 10 cases, all occurred within a month, and 9 belonged to the same military division. In 1, a nasopharyngeal infection is known to have preceded the myelitis. In military practice one should look out for larval cases of myelitis, in view of the value of early serum treatment, shown in 1 of the cases.

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Myeloid sarcomata, ii. 759
Myelopathic albumosuria, see Albumosuria, this Index.
Myiasis.

A cutaneous myiasis was observed in the Panama-Darien district, usually due, according to J. L. Adams, Jr., to the *Dermatobia noxialis.* Man and dog are host by preference. The *Dermatobia noxialis,* though not confining its attack to man alone, can not be called an occasional parasite of man, as it attacks all who are properly exposed. White-skinned races are more susceptible to the disease than the darker races. The period of incubation is from 16 to 23 days, from exposure to the development of the first symptoms. Larvæ differ in shape according to anatomic location. Grub or larvæ, if left alone, will not produce injurious results. Abscess and ulceration are the results of attempted expulsion without proper preliminary treatment.

In reporting a case, M. Wohl (Med. Rec., July 12, 1913) points out that deposition of fly-larvæ in wounds or openings on the surface of the body is not at all uncommon, although infestation with certain varieties is less common than with others. The ordinary house-fly is the usual offender. The eye, the ear, the nose, and the digestive tract suffer the most frequently, and the symptoms vary accordingly. The case reported was characterized by abdominal pain and diarrhea. On developing the larvæ found in the stools, the flash-fly was known to be the cause.

L. Lofton (Va. Med. Semi-Mthly., May 24, 1912) cites an instance of myiasis linearis—an eruption due to a parasite which migrates in the epidermis, probably a gastrophylus or larva of one of the æstridoe, which digs long, straight zigzags or curves in the skin, that may intersect, cross and recross, but never bifurcate. He cured the case by making 3 applications of the following, rubbing it well into the skin.

℞ *Hydrarg.*
  iodid rubr. . gr. xl (2.6 Gm.).
 Hydrarg. oxidi
  flav. .... gr. xxx (2.0 Gm.).
 Acidi carbolici. gtt. xx (1.25 c.c.).
 Thymolis .... ʒj (4.0 Gm.).
 Adipis lanæ
  ad .... ℥ij (60.0 Gm.).

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Myocarditis, v. 239
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In a number of soldiers Nobécourt and Peyre (Paris méd., Dec. 23, 1916) noted sciatica and spinal meningeal reactions, accompanied by cervical rheumatic phenomena and dilatation of the heart. No symptoms attract attention to the heart, but it is enlarged, and the patient should be

given a leave of absence of a month or 2.
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Myopia, vi. 776

School myopia, according to Koster (Nederl. Tijd. v. Geneesk., June 24, 1916), is a mild, generally inherited chorioretinitis. The underlying pathologic condition requires treatment. The glasses should merely correct the myopia enough for the child to see the blackboard. For close work he should take off the glasses. On the street he can wear them or not as he chooses. Children who cannot be kept from holding the book close to the eyes should be given positive glasses of 1 or 2 D. and be warned not to stoop forward in reading. If the myopia reaches 4 D., 2 D. working glasses can be given, the aim being to prevent excessive accommodation. For chronic chorioretinitis, **salicylates, mercury,** or **iodides** are advocated, all in minute doses but kept up long, with occasional intermissions. Everything tending to drive the blood into the head should be avoided, also fine handwork of any kind. The myopia can thus be kept within a low range.

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correct posture in, vi. 779
exact optical correction in, vi. 778
mercury cyanide in, vi. 682
near work limited in, vi. 779

An apparatus to exert **pressure directly on the eyeballs,** intended to shorten and widen them, is described by Bacchi (Bull. de l'Acad. de méd. de Paris, Jan. 16, 1917). The myopia was materially improved after a few treatments at all ages.

Myopia (*continued*).
  removal of crystalline lens in, vi. 779
  surgical treatment in, vi. 779
Myositis, vi. 732

An epidemic of myositis simulating meningitis is reported by H. Curschmann (Münch. med. Woch., Jan. 2, 1917). The spine and muscles in the neck exclusively were at first involved. In spite of the stormy onset, the myalgia and contracture passed off harmlessly in 4 to 8 days. In a few cases there was a prodromal stage of pains in limbs and back, and in 1 acute rheumatism had preceded. After recovery, unilateral chorea developed. Treatment comprised salicylates and heat, dry or moist, locally.

  fibrosa, vi. 738
    electricity in, vi. 739
    hot-air baths in, vi. 379
    massage in, vi. 739
    passive movements in, vi. 739
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    drainage in, vi. 734
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Myotonia congenita, vi. 750

According to McCouch and Ludlum (Med. Rec., June 10, 1917), there is evidence that thyroparathyroid deficiency is etiologically related to myotonia congenita. Myasthenia is frequently associated with hyperthyroidism, hypoadrenalism, and probably with hyperactivity of the thymus. Hyperthyroidism and findings suggesting both hypo- and hyperactivity of the thymus have been noted in amyotonia. Myopathy has been found with many disorders of internal secretion, perhaps oftenest with hypopituitarism. Thyroid and thymic hyperfunction are frequently observed in hypopituitarism.

  mental rest in, vi. 750
  systemic gymnastics in, vi. 753
  warmth in, vi. 751
Myrrh, vi. 779
Myxedema, viii. 556

In every branch of medicine, R. L. Pitfield (Amer. Jour. Med. Sci., Mar., 1916) emphasizes, one meets with manifestations of athyrosis even in those not myxedematous. Mysterious anemias, weak hearts, neuralgias, headaches, glycosurias, precardial pain and distress, and nocturnal bed-wetting are instances. Some cases of psoriasis and eczema, milk-crust in children, alopecia, and psoriasis are amenable only to thyroid treatment. In laryngology, laryngitis, aphonia, tinnitus aurium, even deafness, Eustachian stuffing, and intractable catarrhs depend upon athyrosis. Blepharitis in the aged can be cured with thyroid substance. Iron, arsenic, and digitalis, combined with rest, massage, and Nauheim baths must in many cases be employed in addition.

    digitalin in, viii. 559
    pituitary gland in, viii. 559
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    thyroid gland in, i. 710, 723, 743, 751; viii. 558
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    borax solution in, vi. 782
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Naphthene oils.
Naphthalol, viii. 48
Naphthol aristol, vi. 786
  camphor, vi. 787
  -salol, viii. 48
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  asthma, thyroid gland in, i. 748
  bones, fractures of, iv. 761
  calculi, see Rhinoliths, vii. 100
  catarrh, see Rhinitis, this Index.
    chronic, see Rhinitis, Chronic, Simple, vii. 70
    chronic hypertrophic, see Rhinitis, Hyperplastic, vii. 76
    dry, see Rhinitis, Atrophic, vii. 79
    syphilitic, salvarsan in, iv. 209
  cavities, see Nose and Nasal Cavities, Injuries and Diseases of, vii. 68
    carcinoma of, vii. 92
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      In 2 cases of rhinal myiasis observed in soldiers by E. C. McCulloch (Milit. Surg., Sept., 1914), inhalation of chloroform vapor on cotton, and use of curette were futile. In the first the maggots were removed in successive sittings with forceps. In the second case irrigations with chloroform water were also ineffectual. In a few days the patients recovered.

    mucous polypi of, vii. 88
      cocaine in, vii. 90
      hydrogen dioxide in, vii. 91
      radical operation in, vii. 90, 91
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    tumors of, vii. 88
  deformities, salvarsan in, iv. 209
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  disinfection, iodine tincture in, vi. 33
    iodoform-vapor in, vi. 53
  duct, diseases of, see Lachrymal Apparatus, Diseases of, vi. 239
  hemorrhage, see Epistaxis, iv. 558; also this Index.
  hydrorrhea, see Hyperesthetic Rhinitis, v. 600; also this Index.
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Nasal operations, eucaine hydrochloride in, iv. 700
    novocaine anesthesia in, vii. 103
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  chronic, alkaline waters in, vi. 710
Nasopharynx, diseases of, see Nose and Nasal Cavities, Injuries and Diseases of, vii. 68
Nauheim treatment, v. 249, 271
Nausea, hydrochloric acid in, v. 556
    mentha in, vi. 648
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    eating to be encouraged in, viii. 341
    isolation in, viii. 341
    sedative drugs in, viii. 341
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  postanesthetic, sparteine in, viii. 98
Neapolitan fever, see Malta Fever, vi. 537
Necator Americanus, see Hook-worm, vii. 313
Neck, angiomata of, ii. 519
  excision of glands of, cocaine anesthesia in, iii. 484
  operations, insufflation anesthesia in, iv. 685
    intravenous anesthesia in, iv. 688
    novocaine anesthesia in, vii. 106
    rectal anesthesia in, iv. 691
  sarcoma of, thiosinamine in, viii. 530
Necrosis of bone, codliver oil in, iii. 513
    potassium bitartrate in, vii. 579
  of cranial bones, v. 172
  of internal ear, v. 689
  of the jaw, vi. 730
  syphilitic, thyroid gland in, i. 751
Necrotic masses, formalin-gelatin powder in, iv. 736
Needle douche, or spray, viii. 811
Nelaton's operation for harelip, viii. 436
Nematodes, vii. 303
Neodioxydiamidoarsenobenzol, iv. 159
Neoformans vaccine, ii. 375
Neoplasms, fulguration in, iv. 428
    mercuric cataphoresis in, iv. 421
    mercury nitrate in, vi. 674
    thyroid extract in, i. 751
  of nerves, vi. 800
Neosalvarsan, iv. 159
Nephralgia, vi. 218
Nephrectomy, vi. 221

For the ligation of the vascular pedicles in nephrectomy, W. J. Mayo (Jour. Amer. Med. Assoc., Mar. 20, 1915) recommends the two-clamp method wherever it is necessary to ligate the pedicle *en masse*. He advises ligation of the veins, arteries, and ureter separately whenever possible.

Ashcraft's personal experience (Hahn. Mthly., li, 565, 1916) in 19 cases (12 tuberculous) in 7 years, the last operated upon having been in November, 1915, shows that the basis of success in nephrectomy lies in compensatory growth of the opposite kidney, as pointed out by Tousson. Nephritis due no doubt to the toxic substances arising from the operative field is followed by hypertrophy of both interstitial and parenchymatous elements and increased function, the latter in excess of the former.

    beta-eucaine anesthesia in, iv. 702
  abdominal, vi. 224
  lumbar, vi. 223
    carbolic acid in, vi. 223
    thermocautery in, vi. 223
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Nephritis, amaurosis in, i. 592
    autogenous vaccines in, ii. 371
    blood-pressure in, ii. 492
    calcium chloride in, ii. 719
    gold and sodium chloride in, v. 74
    silver nitrate in, viii. 135
    theocine in, viii. 527
  acute, ii. 588

Trémolières and Caussade (Annales de Méd., Jan.-Feb., 1917) found that

in about 33 per cent. the kidney disturbances in soldiers on active duty are simple albuminuria. In 67 per cent. there was actual subacute nephritis with a tendency to dropsy. After 6 to 9 weeks in a hospital the albuminuria disappears in about 10 per cent. It persists in 25 per cent. in minute proportions, but varying with fatigue and diet, and thus compelling a guarded prognosis.

aconite in, ii. 605

In 2 cases of acute and 1 of chronic nephritis remarkable benefit was obtained by Borelli (Policlinico, Apr. 30, 1916) with **adrenalin.** To a child nearly 5, he gave 16 drops a day of the 1:1000 solution, 4 drops at 4-hour intervals. The adults were given 40 drops a day, 8 at a time. Ercolani called attention in 1910 to the benefit from adrenalin by mouth in nephritis.

alkalines in, ii. 603
aspiration in, ii. 605
Basham's mixture in, ii. 606
bismuth in, ii. 607
blood-pressure in, ii. 493
buttermilk in, ii. 602
caffeine citrate in, ii. 607
calomel in, ii. 605
cannabis indica in, iii. 8
chloral hydrate in, ii. 607
chloroform inhalations in, ii. 607
cocaine in, ii. 607
convallaria in, ii. 606
cracked ice in, ii. 607
cupping in, ii. 605

In 4 cases of nephritis in wounded soldiers Wilk (Münch. med. Woch., lxiii, 76, 1916) found medical treatment useless, while **decapsulation** of 1 kidney under local anesthetic supplemented by etherization during isolation of the kidney gave excellent results.

diet in, ii. 602, 603, 607
digitalis in, ii. 606, 607
diphtheria antitoxin in, ii. 606
diuretin in, iv. 334
drainage-tube in, ii. 605
elaterium in, ii. 605
erythrol tetranitrate in, iv. 600
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Nephritis, acute (*continued*).
hot air in, ii. 604, 605, 606
hot fomentations in, ii. 603
hot lemonade in, ii. 602, 605
hot pack in, ii. 604, 606
hot soda water in, ii. 605
hot-water bath in, ii. 604
hydrochloric acid in, ii. 607
hydrocyanic acid in, ii. 607
ice-bags in, ii. 607
iodides in, ii. 603
iron in, ii. 606
jaborandi in, vii. 468
jalap (compound powder) in, ii. 605
laxative in, ii. 606
leeching in, ii. 606
light therapy in, vi. 362
lime-water and milk in, ii. 607
linum in, vi. 365
lumbar puncture in, ii. 607
magnesium in, ii. 605
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milk diet in, ii. 603, 606
Mindererus spirit in, ii. 605
morphine in, ii. 607
nephrotomy in, ii. 607
nitroglycerin in, ii. 607
oxygen in, ii. 603
pilocarpine in, ii. 605; vii. 468
potassium acetate in, ii. 607
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puncture of kidney in, ii. 607
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rectal, bromide injections in, ii. 607
rest in bed in, ii. 602, 606
Rochelle salt in, ii. 607
salt restriction in, ii. 602, 603
scammony in, ii. 606
serotherapy in, ii. 607
skimmed milk in, ii. 602
soda-water and milk in, ii. 607
sodium benzoate in, ii. 607
sodium chloride in, ii. 606
sodium citrate in, ii. 606
sodium sulphate in, ii. 605
sparteine in, ii. 606
squill in, ii. 606
stimulants in, ii. 607
tepid baths in, ii. 606
theobromine in, ii. 606
theocine in, viii. 527
vaccines in, ii. 605, 606
vapor baths in, ii. 606

Nephritis, acute (*continued*).
  venesection in, ii. 603, 604, 607

Copious **venesection** followed by **transfusion** of normal blood, according to Burmeister (Jour. Labor. and Clin. Med., Apr., 1917), inhibits both qualitatively and quantitatively the characteristic degeneration usually found in the epithelium of the ascending loop of Henle in the kidneys of dogs acutely poisoned by mercuric chloride.

  warm baths in, ii. 604
  water, free use of, ii. 602
  woolen underwear, blankets in, ii. 602
 acute catarrhal, desquamative, diffuse, exudative, or parenchymatous, see Nephritis, Acute, ii. 588; also this Index.
 and hematuria, v. 398, 400
 ascites of, vii. 367
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  Fischer's solution in, viii. 190
  jaborandi in, vii. 468
  nitrites in, vii. 53
  oxygen baths in, vii. 275
  pilocarpine in, vii. 468
  potassium acetate in, vii. 367
  theocine in, viii. 527
  veratrum in, viii. 806
 chronic desquamative, see Nephritis, Chronic Exudative, ii. 609; also this Index.
 chronic exudative, ii. 609

Diagnosis.—Blood analysis as now employed by A. F. Chace (Med. Rec., May 27, 1916), entails the determination of the uric acid, urea, creatinine, and blood-sugar as a routine, with estimation of the CO_2-combining power in cases where this is indicated. The blood-urea test is of more value than the non-protein nitrogen, because it represents the retention of a definite compound and, further, is more easily and accurately determined. Where good laboratory facilities are available, chemical examination of the blood requires less time and gives more definite data than the quantitative work on urine.

Quintard and Fine (Med. Rec., May 27, 1916) found, in accord with Van Slyke, that the CO_2-combining power normally varied from 53 to 77 c.c. per 100 c.c. of plasma. In nephritis this was generally 40 to 50, and might fall to as low as 25 shortly preceding death. Lowered CO_2-combining power proved a good index for detecting the dyspnea due to nephritis, and also for gauging the efficacy of treatment of the acidosis of nephritis.

Retention of nitrogen outside of convalescence appears, according to Foster and Davis (Amer. Jour. of Med. Sci., Jan., 1916), to precede and lead up to either frank uremic manifestations or the graver complications of renal disease. In many instances the metabolic disturbances seemed confined to failure in elimination of nitrogen. If the **diet nitrogen** is **reduced** and the intake of fluid is increased, the retained nitrogen is swept out and equilibrium is resumed. (See also Kidney, Functional Tests of, this Index.)

I. Harris (Med. Presse and Circ., June 27, 1917) states that he has been using **adrenalin** a considerable time, both as a diuretic and for lessening albuminuria, and that the majority of his patients did extremely well under it even where the ordinary methods had proved useless.

Ercolani (Gaz. degli Osped. e della Clin.; Jour. Amer. Med. Assoc., June 2, 1917) referring to the objection that adrenalin might induce arteriosclerosis, states that he has treated persons of 80 with uremia with 60 drops a day of the 1:1000 solution without interruption over long periods, and without the slightest inconvenience. The pulse seemed more elastic and softer while the adrenalin was being taken. Paoloantonio's report of its use in 30 cases of scarlatinal glomerular nephritis (Policlinico, 751, 1913) is cited. In children it may be given in doses of 2 or 3 drops of the solution for each year of the child's age. It can also be given subcutaneously, or by mouth, in doses of from 10 to 20 drops a day for a child between 5 and 10, according to the severity of the symptoms.

Nephritis, chronic exudative (*continued*).
  agurin in, i. 483
  ammonium acetate in, ii. 619
  ammonium benzoate in, ii. 619
  apocynum in, ii. 61
  Basham's mixture in, ii. 619; vi. 87
  blood-pressure in, ii. 493
  blue mass in, ii. 620
  buchu in, ii. 619
  caffeine in, ii. 619
  calcium chloride in, ii. 619
  calcium lactate in, ii. 619
  calumba in, ii. 619
  cannabis indica in, iii. 8
  castor oil in, ii. 620
  chimaphila in, iii. 198
  chloretone in, iii. 218
  chloroform spirit in, ii. 619
  chloroform-water in, ii. 619
  climate in, ii. 619
  cupping, ii. 618
  diet in, ii. 617, 618, 619

Chase and Rose (Trans. Amer. Med. Assoc.; N. Y. Med. Jour., June 23, 1917), found that the determination of creatinine and urea nitrogen affords a convenient means of gauging the renal capacity to eliminate nitrogenous wastes, and noting the response to treatment. A diet adequate in calories, protein, mineral elements, and food accessories results in a happier attitude on the part of the patient, while supplying all the requisite vitamines and the complementing of biologically incomplete proteins. The total daily ash constituents should be decidedly alkaline and rich in calcium. Foods high in phosphorus were partly barred, as were also foods of striking flavors. The day's energy requirement should add up at least 2000 calories, and the protein should not exceed 60 Gm. (2 ounces).

There is no evidence, according to A. A. Epstein (Trans. Amer. Med. Assoc.; N. Y. Med. Jour., June 23, 1917), that protein food is *per se* deleterious to the kidney. It does not affect the albuminuria in nephritis in one way or another. Conversely, large quantities of protein are necessary to restore the tissue waste and to replenish the depletion of the protein constituents of the blood. In practice a **high protein diet** in chronic parenchymatous nephritis led to improvement in general nutrition, causing increase in the protein content of the blood serum, and by reduction of lipoids.

J. H. Barach (Arch. of Diag., July, 1916) holds that where the patient eliminates nitrogen well, meat need not be omitted from the **diet**; similarly, if elimination of salt is not impaired, a salt-free diet need not be insisted upon.

Umber (Münch. med. Woch., Dec. 12, 1916) describes several cases of edematous nephrosis showing prompt benefit under **restriction of salt and water.**

  digitalis in, ii. 619, 620; iv. 149
  diuretin in, iv. 334
  eucalyptus in, iv. 705
  euonymus in, ii. 619
  exercise in, ii. 620
  glycerin in, ii. 619
  hot Nauheim baths in, ii. 620
  iron in, ii. 619; vi. 87
  jalap in, vi. 90
  juniper in, vi. 174
  kidney organotherapy in, i. 791
  magnesium sulphate in, ii. 619; vi. 474
  massage in, ii. 620
  mercury in, ii. 619, 620; vi. 683
  methylene blue in, ii. 620
  milk diet in, ii. 618
  mustard poultices in, ii. 618
  nitroglycerin in, ii. 619
  opium in, vii. 189
  podophyllum in, ii. 619
  potassium bitartrate in, vi. 174; vii, 578
  potassium citrate in, ii. 619
  rest in bed in, ii. 619
  rhubarb in, ii. 619
  saline cathartic in, ii. 620
  sodium benzoate in, ii. 618
  sparteine in, viii. 97
  squill in, ii. 620
  strontium lactate in, ii. 619; viii. 409
  sulphuric acid in, ii. 619
  surgical measures in, ii. 619

J. H. Morse (Trans. Amer. Med. Assoc.; N. Y. Med. Jour., June 16, 1917) states that in Edebohls's operation upon children, the restoration of the circulation from without was not beneficial because it could not restore the cortex. It was better to decapsulate and obtain a new capsule with a new blood supply.

theocine sodium acetate in, ii. 619
turpentine in, viii. 635

Phipps (Boston Med. and Surg. Jour., Jan. 20, 1916) states that more freedom in the allowance of protein than is recommended in the textbooks may be of great advantage. **Thyroid gland** seems valuable in nephritis if given carefully.

woolen underwear in, ii. 619
chronic interstitial, see Nephritis, Chronic Non-exudative, this Index.
chronic non-exudative, ii. 620

Prognosis, ii. 629.—From the standpoint of fitness for military service, Geigel (Münch. med. Woch., Nov. 21, 1916) states that the very chronic forms of interstitial nephritis and true contracted kidney, developed insidiously, do not exclude service unless the pressure be over 180, or acute attacks of parenchymatous inflammation, edema, uremia or cerebral hemorrhage have occurred. Garrison duties are permissible when the pressure is below 180, particularly in the young or middle aged, but arteriosclerotic contracted kidney excludes even light service.

aconite in, ii. 631
agurin in, i. 483
amyl nitrite in, ii. 631
arsenic in, ii. 631
caffeine citrate in, ii. 631
calomel in, ii. 631; vi. 678
chloroform in, ii. 631
climate in, ii. 631
cold applications in, ii. 631
decapsulation in, ii. 631, 634; viii. 210
diet in, ii. 630, 631
digitalis in, ii. 631
distilled water in, ii. 631
exercise in, ii. 630
hot applications in, ii. 631
hot bathing in, ii. 631
iodides in, ii. 631
kidney organotherapy in, ii. 631
laxative mineral waters in, ii. 631
milk diet in, ii. 630

Nephritis, chronic non-exudative (*continued*).
morphine in, ii. 631
nitroglycerin in, ii. 631
pigs' kidneys in, ii. 631
salines in, ii. 631
strychnine nitrate in, ii. 631
surgical measures in, ii. 631
chronic parenchymatous or tubal, see Nephritis, Chronic Exudative, ii. 609; also this Index.
chronic productive diffuse without exudation, see Nephritis, Chronic Non-exudative, ii. 620; also this Index.
scarlatinal, **sodium bicarbonate** in, viii. 192
syphilitic, **salvarsan** in, iv. 204
trench.

Symptoms.—A close study of 58 cases from the trenches led W. L. Brown (Lancet, Feb. 19, 1916) to regard this disease as a true acute nephritis, as shown by edema with albuminuria, the nature of the urinary proteins, tests of renal permeability and the *post-mortem* findings. There is a specific organism which resembles, but is not identical with, that of scarlet fever, as held by some. He emphasizes the frequency of dyspnea from the start, a tendency to remission and relapse, and the usually favorable prognosis.

On the eastern firing line it was characterized, according to Rostoski and Pantaenius (Deut. med. Woch., Dec. 14, 1916) by slight and brief fever, a mild course, and the absence of anuria and of much oliguria. Typhoid bacilli were cultivated from the urine in some cases, showing that they might be responsible for nephritis in some cases.

Abercrombie (Brit. Med. Jour., June 24, 1916) found the blood-pressure always high for 5 to 10 days during some period in the disease. There was often an evening rise of 20 to 30 mm. Hg.

Of 2000 military patients observed by Gaud and Mauriac (Paris méd., Apr. 15, 1916) in a military hospital, 130 had acute nephritis. It was distinctly uniform in symptoms and course: A prodromal period of 3 to

6 days, with marked fatigue, obstinate headache, lumbar pains, slight dyspnea, and rarely anorexia and vomiting. Edema of the face and extremities then suddenly appeared, with mild fever the first few days, diminished output of a dark, muddy urine containing 0.2 to 0.5 per cent., up to 1, 3, and even 4.5 per cent., of albumin, a little hemoglobin, epithelial and granular casts, and a few red cells. Under **rest** and a **milk diet** the condition subsided, as a rule, in 2 weeks. One case, admitted while in uremic coma, recovered rapidly after **venesections**. There was but 1 fatal case. Fatigue, excess of meat in the diet, and possibly exposure to cold are held to predispose to the condition.

Etiology.—U. Gabbi (Riforma méd., Sept. 25, 1916), observing 500 cases, states that the etiology is obscure. Cold weather is not the cause, the greatest number of cases having occurred in June. Alcoholism, rheumatism, mild scarlet fever, typhoid, and dysentery have also been excluded. The urinary findings discredit an infectious nephritis. There were reduced quantity, acid reaction, low specific gravity, albumin (2 to 3 per cent.), hyaline and granular casts, rarely epithelial casts, very numerous leucocytes, and a number of red cells. The blood, urine, and throat showed no definite findings. The mortality was 2 per cent. A **diet rich in carbohydrates,** with **complete abstinence from alcohol,** and **rest** and **warmth,** was advocated. The only drug used was **theobromine** when the urine output was reduced.

A number of cases of acute hemorhagic nephritis systematically studied by Kayser (Berl. klin. Woch., Sept. 18, 1916) showed no connecting link other than that all the men had been infested with vermin, a feature common to all cases.

Albu and Schlesinger (Berl. klin. Woch., Feb. 7, 1916) state that it does not resemble a septic nephritis, and that the most plausible factors are dietetic—with irregular meals, and especially absence of fresh fruits, fresh vegetables and fatty substances. The preserved foods contain an excess of salt, and their protein content is known to have undergone notable changes which are not without effect on metabolism.

C. P. White (Lancet, May 13, 1916) in an analysis of the urine of 4 cases, found lead in all, and tin in 1, though absent in the urine of nephritics other than trench cases. This suggests that the tin and solder of canned goods may bear some relation to the disease.

Ameuille and McLeod contend (Bull. de l'Acad de méd., Aug. 1, 1916) that exposure plays a part similar to that played in many infections, through defective circulation and diminished resistance in the kidney, but that diet affords an explanation of the transitory albuminuria and mild nephritis, acting as a contributory factor in the more severe cases. They hold that the average soldier takes protein food in excess of his needs, throwing added strain on his excretory organs, that the many cases of gingivitis indicate the effects of a restriction in fresh vegetable foods, and that, finally, there is evidence of the existence of a slightly scorbutic condition prevailing among the men. This reduces renal resistance along with its effects upon other organs.

R. L. Thornley (Brit. Med. Jour., Dec. 16, 1916) cultivated a coccus in all of 27 consecutive cases. It grows readily on ordinary agar as a fine growth not unlike *Micrococcus melitensis.*

Treatment.—Magnus-Alsleben (Münch. med. Woch., Dec. 21, 1916) holds trench nephritis to be merely the familiar acute glomerular nephritis with a tendency to edema, such as we see after scarlet fever. To spare the renal tissue he adjusts the fluids allowed according to the output of urine, and reduces the nitrogen and salt in the food, though allowing ample calories. The favorable influence of this **function-spar-**

ing diet is remarkable. Copious diuresis soon sets in, without other measures, and the blood-pressure drops to normal. In the last 15 cases he gave the men nothing to eat or drink for 3 or 4 days, and then let them drink copiously.

Nephrolithiasis, vi. 192

That pain from disease in 1 kidney may be referred completely to the opposite, actually normal, side is emphasized by H. A. Fowler (Surg., Gynec. and Obstet., Apr., 1916). Complete preoperative examination of every case of suspected renal calculus by the X-ray, cystoscopy, ureter catheterization, and renal functional tests is therefore advisable.

- between attacks, vi. 196
  - acidification of urine in, vi. 196
  - alcohol forbidden in, vi. 196
  - alum in, vi. 196
  - belladonna in, vi. 196
  - benzoic acid in, ii. 456; vi. 196
  - boric acid in, vi. 196
  - buchu in, vi. 196
  - calcium carbonate in, vi. 196
  - codeine in, vi. 196
  - cystoscopy in, viii. 678
  - diet in, vi. 196
  - diuretics in, vi. 196
  - ergot in, vi. 196
  - gallic acid in, vi. 196
  - glycerin in, v. 30
  - hyoscyamus in, vi. 196
  - lime-waters, vi. 712
  - lithium salts in, vi. 196, 367
  - litholapaxy in, vi. 197
  - nephrolithotomy in, vi. 212

Pelviolithotomy is the most generally useful operation for stone in the kidney, according to W. J. Mayo (Surg., Gynec. and Obstet., Jan., 1917). As shown by Brodel, the anterior row of calyces and the anterior half of the posterior row in about 95 per cent. of cases are supplied by the anterior renal arteries, and the kidney is notched on the posterior surface. In the small remainder the contrary is true. In operating the kidney is separated from its fatty capsule and brought well up into the wound so as to expose the pelvis in the notch. If the stone is felt, it is removed by direct incision, and a search is made with the finger within the pelvis for others. The pelvis is then sutured with catgut, the kidney dropped back, carefully surrounded by its fatty covering, which should not have been lacerated, and 2 or 3 rolls of rubber tissue introduced into the kidney space for temporary drainage.

Bland-Sutton (Lancet, July 1, 1916) condemns the preservation of a disorganized and septic kidney. It entails future suffering from recurrent calculi, repeated operations, and finally removal of the kidney under adverse conditions. Endeavors to save such damaged kidneys are glaring instances of surgical timidity.

  - spinal anesthesia in, viii. 209
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Nephropexy.

Albarran's technique is regarded by Brandao (Jour. d'urol., vi. No. 6,

1914-1915-1916) as superior to all others. He finds that its drawback, the stripping of the capsule from the anterior wall of the kidney, is unnecessary. He avoids it by taking 2 stitches in the turned back capsule just posterior to the convex edge. The capsule is cut away over the larger part of the rear wall, but enough is left to cover the edge all around. As it is peeled off, it is divided two-thirds of the way down into halves, leaving a broad pedicle below. Each half is then tied separately with catgut to form a stout pedicle, as in Albarran's technique.

Nephrotomy, vi. 218

To avoid the hemorrhage following nephrotomy Tschaika (Deut. Zeit. f. Chir., Nov., 1914) recommends Federoff's method of tamponing the renal incision with perirenal fat. The fat does not produce the marked kidney destruction observed after the use of sutures.

Drip drainage is used after nephrotomy by Devroye (Paris méd., Aug. 12, 1916). He introduces a No. 14 Nélaton catheter, the tip of which has been cut, through a longitudinal incision in the kidney pelvis, fastening it so as to permit the lower end to reach the funnel formed by the entrance to the ureter. It is connected above with a drip irrigator ensuring a flow of a 5-fold dilution of Dakin's solution in severe infection. In the others a 1:10,000 solution of potassium permanganate is generally sufficiently active.

Keyes (Jour. of Urol., Feb., 1917) opened the kidney parenchyma in 3 cases to extract stone, inserted a probe into the renal pelvis, and on this opened the pelvis widely, inserted a rubber tube there for drainage, and closed the parenchyma by suture. All healed promptly.

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blocking.

For nerve blocking for the neck and arm, Santoni (Presse méd., Feb. 1, 1917), having injected the anesthetic in salt solution ranging from 15 to 30 per 1000, and also in pure water, found that the hypotonic solutions induced the anesthesia more promptly, but it did not last over an hour, while with the hypertonic solution the effect was slower in developing, but lasted longer.

Sievers (Arch. f. klin. Chir., cvii, Nu. 4, 1916) was able to operate on the thigh or leg without pain in 20 cases by local anesthesia induced by the infiltration technique applied to the segment of the limb, 2 or 3 cm. wide, between two broad constricting elastic bands. In from 20 to 30 minutes the limb below this could be operated on, even with operations lasting up to 1½ hours. The analgesia keeps up as long as the circulation below is interrupted.

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For nerve grafting in paralyzed limbs Mayo-Robson (Brit. Med. Jour., Jan. 27, 1917) found that, in the absence of recently removed nerve, such a structure as the spinal cord of a rabbit may be successfully used as a graft. In a case cited, there had been complete division of the median, ulnar and internal cutaneous nerves.

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For nerve suture Frouin (Presse méd., Jan. 8, 1917) uses, instead of catgut sutures, fine silk and the finest obtainable needles. In this way it was found possible to suture the perineurium without any injury to the axis cylinder fibers.

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In the present war, according to H. Fischer (Annals of Surg., lxv, 56, 1917), owing to the velocity of the modern rifle small caliber bullet, perforation of large nerves is not rare. In certain cases, however, the nerve is not injured, while in others, fine particles may become embedded in it, causing palsy and often unbearable pain. Secondary paralysis may develop from the healing of the wound, the nerve having escaped the bullet. The nerves most frequently affected are, in order of frequency, the radial, ulnar, median, peroneal, sciatic, and brachial plexus.

Limouzi (Jour. de Radiol. et d'Elect., Jan.-Feb., 1917) urges that after a nerve war wound heals it should be given 3 months of **massage, hydrotherapy, mechanotherapy, electricity, hot air,** etc. If no improvement follows, and the reaction of degeneration grows worse, operative measures are indicated. It is better to refrain from them if the symptoms and reaction are improving, or if only 1 is stationary.

J. R. White (Brit. Med. Jour., Mar. 24, 1917) holds that repair of an injured nerve should never be undertaken as long as bacteria be present in the tissues, even in latent foci. When the nature of the lesion is unknown, operation should not be postponed beyond a reasonable period of probation in the absence of signs of returning function.

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Porter (Surg., Gynec. and Obstet., Feb., 1917) sounds a note of warning about tourniquet paralysis. A rubber tube should never be used about the midarm. Even if the arm is padded, the nerve may be crushed against the bone.

  regeneration.

Kirk and Lewis (Bull. Johns Hopkins Hosp., Feb., 1917), found that in the immediate vicinity of nerve trauma with solution of continuity there occurs an accelerated hyperplasia of the neurolemmal elements which results in the early formation of protoplasmic bands. These develop in both the proximal and distal stump and tend to bridge the defect. The regenerating axis-cylinders from the central stump pass along these protoplasmic pathways.

The best evidence of nerve regeneration, according to Goriat (Boston

Med. and Surg. Jour., Feb. 8, 1917), is seen in the protopathic system. Here pain points of various intensity and number can be demonstrated in the midst of an area otherwise completely analgesic.

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Neuralgia, vi. 809

The war has rendered burning neuralgic pain comparatively common, according to R. Leriche (Presse méd., Apr. 20, 1916), and confirms the assumption that it is a neuritis of some part of the sympathetic system. Success attends therapeutic measures aiming to modify the peripheral sympathetic. The writer strips the peripheral arteries, supplementing this denudation by severing the perivascular nerves and, when possible, removing the entire sheath of the vessel over a certain extent. In 1 case of agonizing causalgia from a gunshot wound, he denuded the humeral artery and excised its sheath for a stretch of 12 cm. Improvement followed at once.

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Lian (Presse méd., Aug. 7, 1916) directs attention to cardiac disturbances in left-sided intercostal neuralgia, having recently seen 4 such cases. In the more severe forms, they constitute actual attacks of angina pectoris. In the less severe, there occur paroxysms of palpitation, or of dyspnea and palpitation, following physical exertions and at times accompanied by a dizzy malaise or syncopal tendencies.

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L. J. J. Muskens (Nederl. Tijd. v. Geneesk., June 24, 1916) proceeds as for gasserectomy, but instead of resecting the ganglion he crushes with clamps the second and third branches as they leave it. This causes the cells in the ganglion to atrophy and wither beyond repair, while the operation itself is comparatively harmless.

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Neurasthenia, vii. 1

Cases classified formerly as neurasthenics are, according to Tom A. Williams (Med. Press, Jan. 19, 1916), due to disorders of the internal secretions. Pronounced erethism with psychological excitement occurs in hyperthyroid patients. The depression of hypothyroidism, more particularly in older people, is likewise notable. In dysthyroidism there are peculiar recurrent states of neurasthenia, great prostration, and inability to concentrate, well described by Dejerine; pituitary disorders, too, create neurastheniform symptoms. Insufficient secretion of the adrenal gland may also produce neurasthenia, characterized by extreme asthenia, inability to think clearly and discouragement in consequence, accompanied, as a rule, by low blood-pressure.

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The administration of thyroid, corpus luteum or pituitary gland, or combinations of them, is recommended by H. R. Harrower (Amer. Jour. of Obstet., Apr., 1916), in addition to hygienic measures or other drugs that may seem to be indicated.

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Kilgore (Boston Med. and Surg. Jour., Sept. 14, 1916) states that peripheral neuritis after emetine is not uncommon. The most common symptoms are muscular pain and weakness, usually most pronounced in the legs, sometimes going on to paresis. They often develop after the emetine injections have been stopped, and may grow progressively worse for some time. The total amount necessary to produce neuritis varied in 9 cases from 4 grains (0.26 Gm.) in a child to 19½ grains (1.25 Gm.) in an adult. Many receive larger amounts, however, and have no symptoms. The symptoms clear up gradually.

E. C. Rosenow (Trans. Amer. Assoc. of Immun.; Jour. Amer. Med. Assoc., July 15, 1916) isolated a streptococcus having peculiar properties from the dead pulp of the left upper first molar in the region where the attacks of pain usually began. He also found it in the sections, and isolated from the infiltrated deep fascia and muscles of the left side of the neck. A similar streptococcus was isolated from the pharynx and stool; also in the experimental lesions in animals whose blood was sterile—the lesions being reproduced on reinjection, and the streptococcus again isolated. It had elective affinity for the pulp of teeth, dental nerves and muscles of animals.

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Alfred Gordon (Therap. Gaz., June 15, 1916) describes 16 cases of sciatica, 8 of neuritis of the anterior crural, 6 of neuritis of the external peroneal, and 2 of neuralgia of the infraorbital, treated with **hot saline solutions.** To avoid any direct damage by alcohol, the solution was always prepared with freshly distilled and sterilized water for immediate use, and injected hot. A large syringe of glass or metal is used, as for lumbar puncture. The needle is inserted first, and if no blood appears at its outer end the syringe it attached, after all air is expelled. The piston should be pushed in slowly to avoid tearing of tissue and possible hemorrhages. The amount injected varies according to the nerve and its location. For the sciatic, he injects up to 200 c.c.; for the anterior crural, 50 c.c., etc. The slight swelling disappears in 24 or 48 hours. The tenderness remaining somewhat longer. Some of the patients had been free from pain for months, and even 2 years; others had some very mild recurrences. A repeated injection promptly relieves the disorder.

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Quoting Mörchen's report that he only found 5 cases of war neuroses among 40,000 war prisoners at the Darmstadt prisoners' camp, Lust (Münch. med. Woch., Dec. 26, 1916) recently reviewed 20,000 war prisoners to select those to exchange, and he too found the war neuroses rare among both military and civilian prisoners of war.

The hysteric manifestations of war neuroses, according to Mann (Berl. klin. Woch., Dec. 11, 1916), are the result of some powerful emotion or physopsychic concussion. The treatment for certain cases is to induce some violent new commotion which will crowd the former to one side. Kaufmann employed **startling electric measures with suggestion and exercise, orders in a crisp military tone,** keeping up the sitting until the man is cured, even if it takes 2 hours or more. The author succeeded with somewhat milder means.

H. Campbell (Pract., May, 1916) comments on the small proportion of instances of nervous breakdown among soldiers exposed to the recent severe ordeals. In 70 such cases 7 had previously suffered from traumatic neurasthenia, 4 had had a nervous breakdown, 4 had a neurotic family history, while others had had active syphilis. A highly unstable nervous system succumbs to slight strain, while a stable one shows remarkable powers of endurance. The morbid phenomena may appear as coarse tremors, paralyses, contractures, unilateral anesthesias, unilateral or bilateral blindness, deafmutism, neuralgia, and hysteria. In the latter, **kindness and suggestion coupled with**

firmness, avoiding electricity, give best results. **Surprise,** such as awaking a blind patient in the night and telling him that he can see, or specifying a time when he shall see, is often efficacious; **re-educating the** voice in deafmutes; **overcorrection** of contractures and placing the limb in splints are advocated.

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J. F. Baldwin (Med. Rec., July 29, 1916) insists that nitrous oxide is not nearly so safe as chloroform, always considered dangerous. He quotes 14 deaths known to have occurred in Columbus alone. Gwathmey reported 3 fatal cases in 2500. In all reported cases death occurred suddenly before any marked change was noticed, and all efforts at resuscitation proved unavailing.

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F. C. Irving (Boston Med. and Surg. Jour., Mar. 30, 1916) holds nitrous oxide and oxygen the most successful analgesic known for *labor* pains. It is safe, has no untoward effects, immediate or remote, upon either mother or baby; it does not delay labor or impair the efficacy of the uterine contractions.

F. K. Camp (N. Y. Med. Jour., Apr. 29, 1916) found that the time of *labor* was materially shortened under nitrous-oxide-oxygen anesthesia because the pains were more frequent and stronger, while during the expulsive stage the patient, feeling no pain, brought the secondary muscles of expulsion to their best work. Perineal lacerations, with an experienced administrator, were also less frequent.

A. B. Cooke (Med. Rec., June 17, 1916) performed 300 operations under gas-oxygen in the past 3 years. While he had no fatality chargeable to the anesthetic, difficulties noted were: Obtaining a competent anesthetist; cumbersome apparatus; the high cost of gas, and the necessity for using pure gas.

A. J. Browning (N. W. Med., Feb., 1917) believes nitrous-oxide-oxygen applicable to about 85 per cent. of all cases, and that it has several great advantages. Induction is rapid; there is no tendency to rouse latent foci of tuberculosis; it is free from deleterious effects upon any of the organs; it does not diminish natural immunity, and recovery is almost immediate. It should be preceded by morphine and atropine wherever possible.

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Occupational diseases.
      Legislation is increasingly being enacted to protect workers in aniline dyes, lead, phosphorus, arsenic, mercury and their compounds, wood or methyl alcohol, anthrax and compressed air. All these disorders will be found described in this work under their respective headings. There are others, however, due to composite substances, or substances employed

in munition factories, that require special reference.

Skin Disorders.—J. A. Fordyce (Jour. Amer. Med. Assoc., Dec. 7, 1912) gives a long list of occupations that may cause skin disease, some with specific names like "baker's itch," "arsenic pock" of color workers, "beat-hand" of miners, "tar itch," "chimney sweep's cancer," "polisher's itch," "sailor's skin," etc. Gardeners and florists often suffer from contact with certain plants, such as primrose, etc. There are some 60 or 70 plants that may cause skin troubles, and workers in certain kinds of wood, like teak, occasionally suffer. Most industrial dermatoses are not serious, but may become so in susceptible individuals. All should be careful upon ascertaining their condition. Soap and water are sometimes needed to remove the poisons, but in other cases are positively hurtful. Workers on dead bodies and living animals should be warned as to inoculation poisoning.

Arsenic Poisoning.—A list of the trades and professions wherein workers are exposed to arsenic poisoning includes the following: Workers employed in the preparation of arsenic and arsenious acid, in smelting tin and pewter, and in smelting of cobalt; founders of copper or zinc; workers in the aniline industry, or in the manufacture of iron sulphate by the action of sulphuric acid on old iron; chemists; arsenical color workers; manufacturers of colored paper, or of artificial leaves and foliage; aeronauts; inflaters of toy balloons; bronzers of metal; manufactureres of vault lights (glass); colorers and curriers of leather; tinters and dressers of cloth; tanners; taxidermists; manufacturers of artificial stones, or of glass and crystal; jewelers; hatters; manufacturers of colored crayons; artificial soda (salt wort), or glucose; furriers; makers of candles and wax ornaments, of japanned goods, or of carpets; fancy bookbinding; preservation of wood; makers of gloves; sheep dip; electroplating; lithographing and bronzing; artificial leather, oil-cloth and linoleum, cut glass, hat linings, and beer, soaking of silk cocoons, and enameling. (Med. Rev. of Rev., Feb., 1914.)

E. Lindstroem (Wiener klin. Woch., May 1. 1913) and his son, 11 years old, after sleeping in 2 rooms that had just been painted, experienced distressing neuralgic pains which subsided when he lay still. They lasted a month, and then subsided during the summer, but returned the next winter with great severity, and became so bad that he could not use his right hand. An obstinate conjunctivitis developed in the boy, who grew pale and thin. Arsenic poisoning being suspected, it was found in the urine, as well as in that of the other members of the family, and also in large quantities in the oil paint on the walls of the rooms.

Brass Toxemias.—"Spelter chills" is the name given by Riesman and Boles (Amer. Jour. Med. Sci., Mar., 1917) to a condition heretofore described under such varying terms as *brass-founders' ague,* brass chills, zinc chills, smelter shakes, "Giesfieber" or "Staubfieber," and "fièvre des fondeurs." They believe it results from inhalation and ingestion of fumes and flakes of zinc oxide in the melting and volatilizing of spelter (the commercial name for zinc in its impure state). The first symptom is a creepy, chilly sensation up and down the spine, gradually extending throughout the body. It may continue slight, but often develops into a genuine rigor which lasts for ½ to 1 hour or even 2 to 3 hours. At its height, cramps and pains in the limbs are apt to occur; abdominal pain is infrequent, except upon ingestion of cold drinks. The pulse is frequent and there is a slight elevation of temperature. Preceding the chill there is a dry, scratchy sensation in the throat, a sticking, pricking feeling in the tongue, oppression in the chest, and an irritating cough, usually unproductive. Actual dyspnea is rare. There is prostration and nausea, frequently passing into severe vomiting.

Diarrhea is common. As the attack subsides, the patient, quite exhausted, breaks out into copious perspiration, and falls into a deep sleep. A temporary loathing for food and an unpleasant metallic taste in the mouth are present on awakening. The attacks do not often incapacitate the workers.

Acute brass-poisoning, brass chills, brass-founders' ague, *fièvre des fondeurs, Staubfieber* and *Giesfieber,* all refer to the same symptom-complex, according to C. A. Pfender (Jour. Amer. Med. Assoc., Jan. 24, 1914). The symptoms are those of acute brass-poisoning or zinc poisoning, and occur only in workers dealing with molten zinc or brass in foundries. The perfection of the acetylene-oxygen torch has led to much autogenous welding and has remarkably facilitated brazing; but from this "braziers' disease" has arisen.

Iron and Steel Industry.—J. W. Edwards (Brit. Med. Jour., July 22, 1916) states that in the iron and steel industry the mortality at every stage of life is above the standard for "Occupied and Retired Males." It exceeds the average for metal workers generally, being 18 per cent. above standard. At Middlesbrough, where the manufacture of iron and steel is the chief industry, the death-rate for males between the ages of 25 and 65 was 40 per cent. higher than that of females. The diseases causing most deaths were organic heart disease, pulmonary tuberculosis, bronchitis, and pneumonia, the latter causing by far the largest number. The causes appeared to be: working at high temperatures; long hours of work; fatigue; insufficient rest, sleep, and recreation; working at night; careless exposure to cold and wet; intemperance; inhalation of dust; inhalation of poisonous gases, such as CO; trauma. The death-rate from pneumonia is between 2 and 3 times higher in Middlesbrough than in the country generally, and men in the iron and steel industry are much more liable to it than others.

Rubber Poisoning.—Phelps and Stevenson (Hyg. Lab. Bull., 96, U. S. Pub. Health Serv., p. 55, 1914) call attention to the fact that additional materials are now used in rubber compounding to reduce its cost. These include whiting (calcium carbonate), barytes (barium sulphate), clay and various rubber substitutes, such as artificial rubber, oils and tar products, and antimony sulphide to replace sulphur. Recovered rubber, or shoddy, is used to a large extent in rubber compounds, resulting in a varying and generally unknown composition of the mineral constituents of the finished product. Cost and durability are the chief concern of the purchaser. The use of various heavy metals in the manufacture of nursing-nipples and small rubber toys affords a possible unsuspected danger to the health of infants who tend to extract soluble products from such articles in the mouth or by the gastric juice when small pieces are accidentally swallowed. All rubber articles for young children should be of a good grade of black rubber. There can be no objection to a red rubber colored with iron oxide.

Motor Gas Poisoning.—Tanon (Lancet, Jan. 27, 1917) draws attention to the dangers attending the heating of ambulances by the exhaust-pipe of the motor. When the latter functions badly and the joints of the tube are not close, a discharge of gas may occur in the interior of the carriage, and result in consequences which in certain cases have been fatal. This was observed before the war with certain touring cars. The quantity of carbon monoxide mixed with the gas is slight, although the lesions observed at autopsy point distinctly to carbon monoxide poisoning. Officers in charge of ambulances should observe great care in supervising carriages warmed in this way, and should direct the chauffeurs to ascertain the condition of the patients when the motor functions badly.

Nitrite Poisoning.—W. G. Hudson (Med. Rec., Jan. 20, 1917) holds that while the dusts arising in the manufacture of black powder are far less injurious than ordinary dusts, such is not the case with the more modern explosives.

The effects of *nitroglycerin* upon workmen engaged in the explosive industry are known as "powder headaches" and "powder knockout." While chemically a nitrate, it does not act as such, but as a nitrite. The readiness with which it can be absorbed by the skin is surprising. Even shaking hands with a workman, or examining the chest of one of them, is sometimes sufficient to cause headache in one not immune. Unlike many other headaches, relief cannot be secured by lying down, which tends to aggravate the trouble. In severe cases, nausea and vomiting are often present, with great weakness and prostration. All these effects are greatly aggravated by alcohol, workers in nitroglycerin being, therefore, as a rule, very abstemious.

Trinitrotoluene Poisoning.—Agnes L. Learmonth and Barbara M. Cunningham (Lancet, Aug. 12, 1916) urge that the frequency of symptoms of trinitrotoluene poisoning in munition factories among women workers points to irritation by and absorption of some toxic product. The irritative symptoms occur in the respiratory and alimentary tracts and the skin. The toxic symptoms include digestive, circulatory, cerebral, and special symptoms. The workers should be in perfect health, not under 21 or over 40 years of age, and should not be employed more than 12 weeks continuously and not too long daily. A routine weekly examination of these workers is essential. Respirators should be worn, impregnated with some alkaline antidote.

M. J. Stewart (Editorial, Lancet, Jan. 27, 1917) found that the blood changes point to a progressive failure of the leucoblastic function of the bone marrow as a frequent, but not quite constant, manifestation of trinitrotoluene poisoning. The degenerative changes in the liver, once set going, were found to be progressive, even after removal of the patient from contact with the poison.

R. P. White (Lancet, Feb. 19, 1916) observed cases of dermatitis among workers in trinitrotoluene, ammonium nitrate, and nitroglycerine. Trinitrotoluene *dermatitis* begins as a superficial erythema, but as usually seen consists of patchy, irregular-shaped, slightly raised areas of redness, varying in size from a pin-head to a shilling, which coalesce by spreading at the edges and by formation of new centers. The parts most affected are the hands and arms, neck, lower part of abdomen, inside of thighs and scrotum, the back above the buttocks, the calves, and between the toes.

H. S. Martland (Jour. Amer. Med. Assoc., Mar. 17, 1917) reports the necropsy findings in 2 cases developing in this country. The majority of cases have occurred in persons less than 18 and over 50 years of age, and the symptoms almost always develop between the fifth and sixteenth week of exposure. In a man 24 years of age the first symptoms occurred after exposure for 7 weeks. He complained of obstinate constipation, abdominal cramps, tenderness in the liver area, nausea, vomiting, and progressive prostration. He showed a progressively deepening jaundice, low delirium, and anuria, and died in coma. At necropsy the striking feature was a toxic hepatitis with extensive destruction of the liver parenchyma, which showed extreme fatty degeneration, necrosis and autolysis of the liver cells.

Tetryl Poisoning.—Referring to poisoning by tetryl (tetra-nitro-methyl-aniline) used in munition works, Enid Smith (Brit. Med. Jour., Apr. 29, 1916) says that women with obvious eye or skin diseases should not do this work, and all workers should only be taken on probation. The symptoms consist in a yellow staining of the skin, irritation and roughening. In the severest cases there is an edema of the whole face. There may be conjunctivitis, nasal irritation, pharyngeal irritation and sometimes slight constitutional symptoms, though the latter are almost always absent.

Prophylaxis.—Before going into the work-rooms each worker hardens her hands in a spirit lotion (filtered **methyl spirit** 20 per cent., water 80 per cent.) and dusts her face freely with powder (**zinc oxide** 1, starch 3). The workers are warned against touching their faces with their hands. On leaving the works they **wash** their **hands,** using **olive oil soap** or **bran.** The face is wiped free of powder, and a simple greasy preparation may be used at the end of the day.

Treatment.—For the dermatitis, in the severest cases, **steaming the face** with subsequent application of **wet cloths** reduces the swelling and allays irritation. Later on, and in less severe cases, **calamine lotion** acts well, though some prefer **zinc ointment, lanoline,** and **castor oil,** equal parts. He avoids lead lotion, as lead has a dangerous affinity for tetryl. For *conjunctival irritation* **colloidal silver** acts well, though it smarts on application. For *nasal irritation* he uses **liquid paraffin.**

In the early pruriginous stage of trinitrotoluene dust dermatitis, White (Lancet, Feb. 19, 1916) uses:—

℞ *Camphoris*	8 Gm. (2 dr.).
Phenolis	6 c.c. (1½ dr.).
Hydrargyri chloridi corrosivi	1 Gm. (15 gr.).
Acidi picrici ...	2 c.c. (½ dr.).
Alcoholis	180 c.c. (6 oz.).

M. Fiat pingt. Sig.: Apply by a swab or brush.

For home treatment he prescribes 2 ounces (60 c.c.) of the paint mixed with 4 ounces (120 c.c.) of lotio calamin compound, and the addition of ½ dram (2 Gm.) of pulvis acaciæ.

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DaCosta, Funk, Bergeim and Hawk (Rep. Jefferson Med. Coll. and Hosp., vi. i, 1915) report 5 cases of osteitis deformans, and in a review of the literature found 208 additional cases. It was found that a much higher percentage of calcium was retained by the patient than in normal individuals, and a lower percentage of sulphur. This condition is opposite to that in osteomalacia in which the body gains sulphur and loses calcium. Since it is known that parathyroid insufficiency leads to disturbance of calcification, it might easily be inferred that decreased activity of the parathyroids is the cause of the retention of calcium, and abnormal use of that element in overproduction of bone less compact than usual.

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In chronic suppurative osteoarthritis, Bayeux and Vallot (Presse méd., June 29, 1916) recommends the disinfectant and healing action of **sunlight**, not only at the skin surface, but also deeper in the tissues. It should be used in the open air (for glass arrests the beneficial ultraviolet rays), in a warm atmosphere, and in a place free from dust. On the first day only ½ hour's exposure to the sun is indicated; this is augmented by 10 to 13 minutes daily up to a maximum of 2 hours.

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In 1901, A. I. Danilevsky discovered a substance in milk which he designated as "phosphatic albumin," precipitated from the milk whey by alkalies. It is apparently in loose combination with the phosphates. It gives no reaction with Millon's reagent, and is therefore not a true albumin, but an albuminoid, according to Vilenkin (N. Y. Med. Jour., June 17, 1916). Slovtsoff (Roussky Vratch, Feb. 6, 1916) undertook experiments leading to the conclusion that phosphatic albumin has a marked effect on the development of the teeth, and in young animals, also on the long bones. Coincident with more rapid growth, a beneficial effect on the bone marrow is also observed. Apparently this substance in milk belongs to the bone-forming elements.

Schlagenhaufer (Wiener klin. Woch., xxviii, 1362, 1915) reported 2 cases of tumors of the parathyroids. One was in a 43-year-old man who had had osteomalacia for 5 years, while the base of the skull showed changes resembling those of osteitis fibrosa. The left lower parathyroid was the size of a plum; histologically it was almost normal. The other patient was a 62-year-old woman who had had osteomalacia for 15 years. The right lower parathyroid was the size of an almond. Histologically it, too, was almost normal. The author recommended operative removal of the hyperplastic parathyroids. In the discussion Maresch said that he had performed autopsies in 23 cases of malacia of the bones. In 10 cases of osteomalacia in women from 58 to 82 the parathyroids were only moderately enlarged, or had merely not atrophied as had the other parenchymatous organs, thus showing a relative enlargement; but there was no pronounced parathyroid tumor in any of these cases. Bauer recalled that osteomalacia is frequently associated with tetany. Tetany being a sign of parathyroid insufficiency, adenomatous parathyroids might be defective in function; in that case a further removal of parathyroid tissue would be injurious.

In a case of osteomalacia observed by Bull and Harbitz (Norsk Mag. f. Laegevid., lxxvi, 417, 1915), a tumor as large as a walnut was found in the left lower parathyroid gland. They recall that similar tumors have been found in other cases of osteomalacia, but they have also sometimes been found in cases without osteomalacia. Harbitz had also observed a case in which there was a tumor in all 4 parathyroids in a man of 75, with paralysis agitans, in which nothing suggested osteomalacia.

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M. Schmidt (Revue de Thérap., June 15, 1914) found **adrenalin** to have a marked analgesic action in osteomalacia.

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Five years after castration a case reported by Elliott and Nadler (Amer. Jour. Med. Sci., May, 1917) showed no actual improvement in bone structure.

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  Mosetig-Moorhof method in, ii. 557
  removal of bone in, ii. 560
  removal of necrotic sequestra in, ii. 557

Beck (Trans. West. Surg. Assoc., Dec., 1916; Surg., Gynec. and Obstet., Feb., 1917) uses a new method of treating old cases of osteomyelitis of the ribs and long bones. He makes an adequate flap incision; removes every vestige of the diseased tissues under the guidance of the eye; closes the wound so as not to permit any dead space in the resected cavity, and implants the skin-flap. He uses no suture material except ligatures for arteries, and leaves the wounds widely gaping. He reproduces epithelium of granulating surfaces with skin-grafts. He has thus been able to cure nearly all the cases which had previously undergone operation and failed and which could not be cured by injection of bismuth paste on account of sequestra.

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 typhoid.

P. Emile-Weil (Bull. de l'Acad. de méd., Jan. 23, 1917) reports a patient cured in 3 weeks by the vaccine therapy, the case—a typhoidal suppurating bone process that had dragged along for 2 years—having been subjected to 7 futile operations. The cure was complete in 1 week in another case after 11 months of the affection and 3 operations. Improvement amounting to a cure was obtained also in 2 weeks in processes of 6 to 12 months' standing in other cases. It failed only in 1 case, but the removal of a sequester initiated the healing process.

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  zinc valerate in, viii. 836
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W. P. Graves (Trans. Amer. Med. Assoc.; N. Y. Med. Jour., June 30, 1917) states that the ovarian internal secretion being elaborated by the interstitial cells, the latter probably correspond to the lutein cells of the theca interna of the atresic follicle. The interstitial cells of the ovary are analogous to the testicular interstitial cells of Leydig, known to elaborate an internal secretion. Hence ovarian therapy should include at least the product of the interstitial cells. Extracts of ovaries of pregnant animals, with exclusion of the corpora lutea, proved superior therapeutically to extracts of whole ovaries of non-pregnant animals which included the corpus luteum.

C. B. Bucura (Jahrb. f. Psychiat. u. Neurol., xxxvi, 1916) holds that one must give an active preparation in dosage sufficient for results, *i.e.*, until the symptoms disappear. He had good results combating *high blood-pressure* at the climacteric, and *arteriosclerosis* may be thus prevented. All cases with hypofunction of the ovary are indications, especially *amenorrhea* and so-called *lactation atrophy*. In *dysmenorrhea* it is indicated if all other measures fail; likewise in *hyperemesis*, psychoses, especially *dementia precox*, *postpuerperal depression* and *hyperexcitability*.

- pain, acetanilide in, i. 226
- transplantation.

In 12 cases of autoplastic ovarian transplantation reported by W. D. Phillips (Texas St. Jour. Med., xii, 213, 1916), dating from December, 1914, 6 were menstruating regularly every month and without pain. From 5 the postoperative history was unobtainable. In 3 cases the graft was active 2 years after operation. In 1 only was the uterus removed.

The size of the graft varied from ¼ of a normal ovary to a section 1/16 to ⅛ of an inch in thickness. The abdominal wall just to the side of the median incision was the site selected for the transplant, making a pocket in the adipose tissue or beneath the rectus muscle. Menstruation appeared between the second and fifth months after operation.

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Alfred Gordon (Va. Med. Semi-Mthly., Mar. 9, 1917) refers to the tendency of the hypophysis, thyroid, and adrenals to hypertrophy after removal of the ovaries, and lays stress on the psychic and functional nervous disturbances resulting therefrom. Operations on account of complaint of vague nervous disturbances in women are to be avoided.

F. W. McRae (Jour. Med. Assoc. Ga., vi. 158, 1916) has done conservative operations on 338 women. Of 190 supplying reports, 60 were unmarried and 46 of the remaining 130 reported pregnancies. Practically all went to full term. In his work the author resected cystic ovaries, but preserved all healthy stroma, suturing accurately with fine catgut. He endeavors to so separate adhesions, embedded ovaries, and tubes as to leave the least area of raw surface; hanging up prolapsed ovaries, plicating the ligaments, so readjusting uterus, tubes, and ovaries as to approach as nearly as possible the normal.

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Oxaluria.

Oxaluria.—This signifies a persistent excess of calcium oxalate in the urine. Calcium oxalate may occur as a sediment either in acid or alkaline urine, but most often in the former, where it is frequently associated with uric acid deposits; in alkaline urine its most frequent associate is the triple (ammonio-magnesium) phosphate. Uric acid may be oxidized to oxalic acid. A few crystals may occur in normal urine after standing for a long time. Transient oxaluria may follow ingestion of acid fruits or foods containing oxalates (cacao, tea, pepper, sorrell, spinach, rhubarb, etc.). Calcium oxalate is also excreted in excess when an excessive diet of flesh and fat is used. The ultimate source appears to be nucleins and nucleo-albumins. Oxaluria is often associated with marked dyspepsia and hypochondriasis or neurasthenia, dependent upon disturbed metabolism; in gouty cases; in wasting diseases, as in tuberculosis, diabetes mellitus, and cancer; in catarrhal jaundice, spermatorrhea, and with "mulberry calculi"; and in general paresis of the insane.

Detection of Calcium Oxalate.—Calcium oxalate appears as a sediment in two forms—oftenest as minute, regular, highly-refracting octahedra; more rarely as hour-glass- and dumb-bell- shaped crystals. The octahedral crystals have two crossed axes, giving a star or envelope appearance. Presence of calcium oxalate is not necessarily an evidence of its increased excretion, but may be due to absence of the acid phosphates which normally keep it in solution.

Hernando (Jour. Amer. Med. Assoc., from Siglo Medico, Jan. 27, 1917) found oxalate crystals in the stools of patients with mucous colitis or gouty-rheumatic trouble. In treatment, **calcium salts** after meals favor production of calcium oxalate, which prevents absorption of the oxalic acid. **Magnesium salts** neutralize the gastric acidity and impede precipitation of the oxalic acid in the urine. **Sodium** and **magnesium citrate** also

promote solution and elimination of oxalic acid. Maguire has called attention to acid sodium phosphate as a solvent for oxalate concretions.
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Pancreatic stone was observed in 2 cases by Einhorn (Med. Rec., Oct. 23, 1915). Opium or atropine for the pain, with rest, a light diet, hot applications, and alkaline waters after its disappearance, are indicated. If the attacks are frequent, removal of the calculus, if it can be located, or drainage of the gall-bladder, if it cannot, should be resorted to.

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B. Bramwell (Edinburgh Med. Jour., May, 1915) described a case as one of "pancreatic infantilism" in

which pancreatic extract alone brought on bodily and sexual development. He attributed the case to a probable chronic pancreatitis.

insufficiency.

In a case reported by Spriggs and Leigh (Quart. Jour. of Med., Oct, 1916), the gradual onset, absence of jaundice, enormous stools composed one-half of fat and one-third of nitrogen, marked emaciation, glycosuria, and absence of trypsin in the urine led to a diagnosis of pancreatic atrophy. Various ferments irritated the intestine, but fresh pancreas and trypsinogen did not, the latter improving the absorption of fat, this being aided by rest. Pankreon improved the absorption of nitrogen.

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Parathyroids, physiology of.

Wilson, Stearns and Janney (Jour. Biol. Chem., xxi, 169, 1915) find that the introduction of acids into animals relieves parathyroid tetany, and that the relief is more prolonged than after many other agents previously tried. This suggests that the symptoms are the expression of an alkalosis; and also the possibility of a beneficial action due through a variation in the acid-base equilibriums in the body. Koch (Jour. Lab. and Clin. Med., i, 299, 1916) conducted experiments which tended to show that somewhere in the body methylcyanamide is generated. This substance has a physiological value in normal animals. After parathyroid extirpation it accumulates to toxic quantities, and is responsible for the death of the animals.

  tumors of.

Relatively few instances have been reported. Even they have rarely caused symptoms bearing upon the functions of the glands. Harbitz (Jour. Med. Research, July, 1915) states that all the tumors reported cannot be regarded as of parathyroid origin, many being described in intimate association with the thyroid. He adds 2 new cases of parathyroid tumors, 1 associated with osteomalacia and the other with paralysis agitans. The latter showed symmetrical tumors (adenoma) of the parathyroids, which, however, had caused no local disturbance.

Paratyphoid fever.

The importance of the subject of paratyphoid fever is shown by the the statement of Willcox (Lancet, Feb. 26, 1916) that in the Mediterranean expeditionary forces, the total number of cases of true typhoid was only 13.5 per cent.; of paratyphoid cases, 85.5 per cent. Of these latter 47.5 per cent. were paratyphoid A, and 29 per cent. paratyphoid B. According to symptoms, the cases were divided into 3 groups: Those with sudden onset and characteristic symptoms; mild cases, often classed as pyrexia of unknown origin with mild symptoms; and severe toxic cases closely resembling true typhoid.

Symptoms and Diagnosis.—Torrens and Whittington (Brit. Med. Jour., Nov. 13, 1915) recall that the disease is produced by 1 of 2 organisms, and is called paratyphoid "A" or "B," according to that present. The first case was described in 1898 by B. Gwynne. The contention of the Germans that the clinical picture produced by paratyphoid is the result of food poisoning was met by Bainbridge, who showed that food poisonings of this kind are due to *Bacillus suipestifer* and *Bacillus enteritidis*, which may be isolated from such foods.

While paratyphoid is spread in the same ways as typhoid, the ultimate means of spreading it is the presence of some one who has suffered from it. This brings out the importance of the failure by physicians to diagnose many cases of paratyphoid. The disease is frequently mild, therefore receiving but little attention. Its spread by carriers has been extensively demonstrated in the British army, troops from India, where the fever is common, spreading it among other soldiers in France.

There are 2 distinct types of onset: 60 per cent. of the patients feel increasingly ill for a variable number of days (the average being 4) before they report sick. The other 40 per cent. are overcome in a few hours or collapse while at their ordinary duties. The symptoms noted, in the order of frequency, are: headache, diarrhea, abdominal pain, aching pains in the limbs, shivering, extreme general weakness, backache, and epistaxis. Other less common but not rare symptoms are cough, nausea, and vomiting, loss of appetite, dizziness, deafness and constipation.

Usually a condition described as "lethargic," "heavy," "drowsy," "inert," etc., is found, except in the mild cases; the temperature in the second week varies from 99.2° to 102.4° F. (37.3° to 39.0° C.) and produces the "spiky" temperature chart which is characteristic, a steady temperature being observed in only 5 per cent. of cases; the pulse is low in proportion to the temperature, even more so than in true typhoid, *e.g.*, a pulse of 70 when the temperature is 102.5° F. (39.1° C.); the blood-pressure is usually from 80 to 100 mm. Hg., systolic. Spots, which occur in 75 per cent. of all cases, appear in crops which last for 3 or 4 days, are first seen about the 7th to the 10th day, but in some instances as late as the 35th day. The tongue is practically as in typhoid, and the abdomen offers no changes except in about 30 per cent. in which there is some distention. The spleen is enlarged to palpation or percussion in 60 per cent. The only change in the chest is an occasional bronchitis.

The important complications are bronchitis in about 4 per cent., meteorism rarely, hemorrhage (more common in paratyphoid B) in about 5 per cent., perforation in 3 per cent., and thrombosis of the femoral vein in 3 per cent. Other complications and sequelæ are: relapse, recrudescences of fever, pleurisy, empyema, abscess of lung, pericarditis with effusion, tachycardia, laryngitis, tonsillitis, otitis media, parotitis, suppurative orchitis, neuritis, meningismus, mental weakness in convalescence, periostitis, pyelitis, cholecystitis, abscess of spleen, and peritonitis without perforation. The mortality in paratyphoid B was found by these authors to be a little over 4 per cent., of paratyphoid A less than 1 per cent.

A positive diagnosis can be made only by recovering the specific bacillus from the blood, feces, or urine, or, by discovering evidence in the blood that the patient has acquired, or is acquiring, an immunity to a specific infection.

Carles and Marcland (Arch. des Mal. du Cœur., Mar., 1916) state that when the pulse was not above 80 during the first few days, the disease lasted only 16 days on an average. The pulse is important in the prognosis; none died with a pulse under 100. This slow pulse differentiates paratyphoid from typhoid, and any change from it warns of complicating trouble.

In 17 cases of paratyphoid fever studied by Etienne, Jolly and Mondelange (Annales de Méd., Paris, Mar.-Apr., 1917), the cholesterin content of the blood was below normal during the disease and above normal as they became convalescent, finally settling down to the normal figure, 1.5 Gm. This range is like that in typhoid.

Gildemeister (Centralbl. f. Bakt., I Abt., Bd. lxxviii, s, 129, 1916) reports the case of a German soldier who was found to be excreting paratyphoid B bacilli in the discharge from a sinus in his forearm. The man had suffered from "typhoid" 11 years previously; during convalescence pus had been evacuated from incisions in the arm at the site of the sinus.

Willcox (*loc. cit.*) states that at the Dardanelles the mortality ranged between 3 and 5 per cent., paratyphoid A and B being decidedly more serious than is usually supposed. Bacteriological investigation for the early diagnosis of cases and for the recognition of carriers, is advised, also the protective inoculation of the personnel of hospitals against paratyphoid as well as typhoid; reinoculation of troops, if necessary, with a mixed vaccine protective against paratyphoid A and B as well as against typhoid, and finally, the inoculation of troops with a mixed vaccine before going abroad.

H. Wiltshire (Pract., Jan., 1916) failed to get much if any benefit from hexamethylenamine or quinine. The results from vaccines depend on the kind employed; sometimes they are excellent, sometimes doubtful, but a good strain of vaccine is the best agent we have.

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Etiology, viii. 575.—In a study of 1180 cases, Siler, Garrison and MacNeal (Arch. of Internal Med., Aug., 1916) observed that a lower incidence rate among negroes coincided with greater poverty of this race and a diet poorer in quality, quantity, and variety. Incidence was lowest in the sex and age groups of negroes most completely segregated from white pellagrins.

Surgeon Joseph Goldberger, of the Public Health Service (Editorial N. Y. Med. Jour., Aug. 12, 1916), and his associates appear to have proved clinically that pellagra is due chiefly to vitamine absence or insufficiency. No pellagra develops in those who consume a mixed, well balanced, and varied diet, such, for example, as that furnished by the Government to the enlisted men of the Army, Navy, and Marine Corps. It occurs among those who subsist mainly on corn products, bread made from highly milled corn flour, and corn from which the husk or pericarp has been completely removed by the milling. The husk contains the vitamine element.

Assuming that if a specific infection existed it would probably be found either in the blood, nasopharyngeal secretions, skin lesions, or excreta, Goldberger (U. S. Public Health Rep., Nov. 17, 1916) made attempts to transmit the malady by intramuscular, subcutaneous and other methods, without success.

Holmes (Arch. of Internal Med., Mar., 1916) calls attention to the presence of large numbers of organisms of the *B. Welchii* group in the stools of pellagrins, on a dietary composed principally of vegetable foods

high in carbohydrates, and extremely low in animal protein.

G. Tizzoni (Policlinico, Mar. 11, 1917) contends that the germ he has described as the specific agent of pellagra was found present in the blood of all the numerous insane pellagrins examined at the Mombello Asylum, also in a case of pellagrous skin lesions.

arsenic in, ii. 145; viii. 576
atoxyl in, ii. 262; viii. 576
cereals in, viii. 577
change of climate in, viii. 577
chloral in, iii. 209
eggs, soft-boiled, in, viii. 577
elimination of corn in, viii. 577
Fowler's solution in, viii. 576
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J. D. Perdue (Amer. Med., Nov., 1916) recommends 30 drops of **dilute nitric acid** 4 times a day in a glass of water; **copper arsenite,** beginning with 1/100 grain (0.00065 Gm.) and increased to a very large dose. As a routine method, he allows 6 meals, rich in proteins, a day if the stomach can tolerate them; the food is given in semisolid form.

peptonized milk in, viii. 577
potatoes, mashed, in, viii. 577

Joseph Goldberger (Jour. Amer. Med. Assoc., Feb. 12, 1916) found that a diet containing a **liberal amount of fresh animal and leguminous protein** foods, will prevent the annual recurrence of the disease in practically 100 per cent. of cases. The rôle of diet in pellagra was further proved by a study on 11 convicts fed on a diet from which fresh animal and leguminous proteins were largely excluded. Six showed definite symptoms of the disease after several months.

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Booth (So. Med. Jour., Feb., 1916) treated 46 cases with **sodium cacodylate,** with only 1 death. He gave adults an injection deep into the muscular tissues, about 7 grains (0.45 Gm.) once a week, children in proportion.

L. H. Howard (Charlotte Med. Jour., Dec., 1916) has found **sodium cacodylate,** gold in the form of **solutio aurii et sodii chloridi,** and **nuclein** and **protonuclein** in tablet form, of great value. The following foods are recommended in the order of their importance: Fresh beef, milk, eggs, fresh fish, oysters, game or wild fowls, vegetables, nuts, fruits, bread, and cereals.

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Hydrogen dioxide solution is recommended by Bollag (Münch. med. Woch., Aug. 3, 1915), especially in pelvic cases known to be infected. The fluid is freely swabbed or poured directly on any infected area. Apparently no untoward peritoneal reaction follows. In draining through the vagina after hysterectomy he uses a wick soaked in hydrogen dioxide.

Some surgeons are still employing saline irrigation of the peritoneum in acute infective states, not so much, however, for cleansing purposes as for the stimulating effect.

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Prognosis, vii. 376.—Pfeiffer (Penna. Med. Jour., xix, 604, 1916) studied the factors influencing mortality of peritonitis in 63 recent cases of appendicitis, complicated by local or diffuse peritonitis, with the following result: Not purged before admission, 7; recovered, 7; died, 0. Opiates before admission, 22; recovered, 18; died, 4. No opiates before admission, 41; recovered, 38; died, 3.

Prophylaxis.—Chaton (Presse méd., p. 395, 1916) prevents postoperative peritonitis in the following way: After incising he allows a certain quantity of camphorated oil to flow into the abdomen, then places the patient in the operating position, and, after covering the ventral opening, allows a dozen or so inspirations, protective compresses being placed to absorb the excess of oily fluid. Camphorated oil tends to prevent obstruction of the lymphatic channels, checks agglutination of bowel loops, allows prolonged drainage, and plays an important rôle as heart tonic. Three hundred cubic centimeters of 1 to 100 strength can readily be injected. This gave good results.

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The antiseptic action of ether in peritoneal infections, pointed out by French surgeons, was utilized by John Saliba (Jour. Amer. Med. Assoc., Apr. 22, 1916) with gratifying results. The dose for a child 4 years old and over is 1 ounce; for an adult, 3 ounces, instilled just before final closure. Evaporation and absorption are rapid, and ether begins to be excreted in the breath in about 3 minutes. In only 2 out of 248 was there evidence of serious after-effects.

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Crile (Editorial, Therap. Gaz., Sept., 1916) advocates the free use of opium recommended by Alonzo Clark many years ago, on the plea that the common cause of death in peritonitis, as in any acute infection, is exhaustion due to the expenditure of energy in combating the infection; the toxic effects of the acid by-products; the reduced intake of food; and the insufficient sleep resulting from severe pain. The dose should be measured by its effect upon the respiratory rate and not in grains. Laboratory findings show that opium affords intestinal rest, and protects the brain, adrenals, and liver against the damaging effects of toxin. With nitrous oxide and local anesthesia combined, proper drainage, the Fowler position, and physiological rest of the intestines, the chances of a good result are greatly increased.

    oxygen in, vii. 381

O. Laurent (Bull. de l'Acad. de méd., May 1, 1917), experimenting in rabbits with various disinfectant agents for the peritoneal cavity, found much the most promising to be ozone, generated electrically from oxygen. After making a buttonhole incision into the peritoneal cavity, from 5 to 15 cubic centimeters of fecal suspension were injected, and 15 to 30 minutes later, the abdominal cavity subjected to the action of ozone for 15 or 20 minutes. From 5 to 10 liters (quarts) of the gas were used in every case, each insufflation causing temporary meteorism. The ozone tube can be passed through the drainage opening at the close of the operation, and the gas allowed to flow in for about 15 minutes.

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In the modern treatment of acute peritonitis, according to A. Cimoroni (Internat. Jour. Surg., xxix, 243, 1916, from Surg., Gynec. and Obstet.), early laparotomy is of the greatest importance in facilitating precision of technique, while incision over the causative lesion obviates manipulation. While many believe drainage injurious, if done carefully it may accomplish its purpose without injury, facilitating removal of ex-

udate in the dependent parts. Much of the fluid which would otherwise remain in the abdomen can thus be voided. In recent inflammatory conditions where the exudate is principally collected near the involved viscera, complete closure in indicated.
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C. Antonucci (Policlinico, Sept. 24, 1916) highly recommends local treatment with a 20 per cent. suspension of **iodoform in glycerin,** sterilized separately. The patients were restricted to milk at the time. He only aspirates an effusion if compelled to by circumstances.

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Paul Eisen (Amer. Jour. Roentgenol., Jan., 1917) treated 11 cases of tuberculous peritonitis with deep X-rays. The results were very satisfactory. The average duration of treatment was from 8 to 12 weeks. The dose was regulated by the gain in weight.

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Phosphaturia.

Phosphaturia signifies a persistent excess of phosphates in the urine. Phosphorus exists in normal urine in combination with the alkalies (potassium, sodium, ammonium) and the earths (calcium, magnesium). Only the latter are met with as urinary deposits. The earthy phosphates are the triple or ammonio-magnesium phosphate, and calcium or lime phosphate. They are held in solution by urinary acidity. When the urine becomes neutral or alkaline they are precipitated; also by heat, especially when in excess or when the urine is but faintly acid. Addition of dilute acetic acid will dissolve the precipitated phosphates, and thus differentiate them from albumin and pus. The alkaline phosphates are present in larger amount (about two-thirds of the total phosphoric acid).

The phosphates are normally *increased* by ingestion of phosphoric acid, and soluble phosphates; by excess of protein food; and by nerve strain. Pathologically they are increased in inflammatory diseases, traumatic meningitis, acute rheumatism, rickets, extensive bone-disease, and "phosphatic diabetes." They are normally *decreased* during pregnancy; pathologically, in maniacal paroxysms, melancholia, general or sexual exhaustion, nephritis, and dyspepsia.

Detection of the Phosphates.—Phosphatic urine usually has a stale, ammoniacal odor, a whitish turbidity, and a copious light-colored granular sediment after standing. Microscopical examination reveals calcium phosphate either as amorphous, minute, pale granules arranged in irregular patches, or as crystals appearing singly in "knife-blade," "arrow-head," or "slender-wedge" shape, or in stellate clusters. The crystalline form is rare. The ammonio-magnesium phosphate crystals are transparent, rhombic or triangular prisms, "coffin-lid"-shaped. All the above are soluble in acetic acid. Calcium oxalate crystals are not.

Heat Test.—The earthy phosphates are precipitated by adding sufficient ammonia to make the urine distinctly alkaline, and applying gentle heat. Filter the earthy phosphates out, and add to the same urine a saturated solution of magnesium sulphate, to obtain the alkaline phosphates.

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F. X. Dercum (Med. Rec., Apr. 8, 1916) reports a case of probable pineal disease in a man 28 years old, of diminutive stature, without hair on the face and in the axillæ, and but slight growth on the pubes. For months there had been headache and vomiting. Optic atrophy consecutive to neuritis was found. Carbohydrate tolerance was unaltered, and there was no change in the size of the bones; nor could any change in the size of the thymus be demonstrated. The X-rays disclosed internal hydrocephalus, with atrophy of a portion of the sphenoid bone.

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Pineal gland (*continued*).
physiology of.

G. Horrax (Arch. Internal Med., May, 1916) successfully extirpating the pineal in guinea-pigs and rats, found that this caused in male guinea-pigs a hastened development of both the testes and seminal vesicles. The pinealectomized females appeared to show a tendency to breed earlier. Evidence of hastened maturity was also observed in rats.

C. P. McCord (Jour. Amer. Med. Assoc., July 18, 1914; Aug. 7, 1915), having fed pineal or injected it in small growing animals, found that it caused a more rapid growth of the body than normal, and determined an early sexual maturity.

W. E. Dandy (Jour. Exper. Med., xxii, 237, 1915) executed pinealectomy with great care in puppies. The experiments seemed to yield nothing sustaining the view that the pineal gland has an active endocrine function.

F. Fenger (Jour. Amer. Med. Assoc., Dec. 16, 1916) states that a comprehensive study showed the pineal to be practically devoid of any material pharmacologic action. Further, its extirpation from young animals failed to have any deleterious effect.

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L. J. Pollock (Jour. Amer. Med. Assoc., Jan. 30, 1915), emphasizing the frequent association of hypopituitarism with hydrocephalus, recalls Bailey and Jelliffe's study of 60 cases of tumors of the pineal gland, 30 of which showed hydrocephalus with obesity. The latter suggested involvement of the pituitary through pressure exerted upon it as well as upon the pineal by the fluid. The author reports a case illustrating this condition at the autopsy.

Simmonds (Deut. med. Woch., Feb. 17, 1916) reported a case of peculiar, severe and persistent cachexia which ended fatally after many years, the autopsy revealing no lesions other than destruction of the hypophysis—a typical deficiency disease. This view was borne out by 2 other recent cases. The 3 cases suggest that a very small portion of the gland can functionate, the cachexia appearing only when it is entirely destroyed.

extracts of, i. 776

Pituitary extracts, when prepared by certain methods, yield, according to Watanabe and Crawford (Jour. of Pharmacol. and Exper. Therap., Jan., 1916), color reactions suggesting epinephrin or an epinephrin-like compound. The physiologic actions of such solutions can be explained by the presence of such a compound, modified by admixed substances. That epinephrin has not yet been isolated from these glands may be due to the small amounts present.

T. B. Robertson (Jour. Amer. Med. Jour., Apr. 1, 1916) terms tethelin a substance isolated in relatively pure form from the anterior lobe of ox pituitary. It was found to retard the early growth of animals, but to markedly accelerate postadolescent growth. The animals receiving it were smaller but heavier than controls, and showed favorable effects on their skins. Animals deprived of food for a time and then given unlimited food, regained weight more rapidly when given tethelin than controls. It stimulated the healing of wounds. The substance has marked powers in influencing the growth of tissue. It was given orally and hypodermically with the same results.

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A striking fact in the therapy of *cretinism,* according to R. S. Haynes (Jour. Amer. Med. Assoc., June 19, 1915), is that symptoms due to hypothyroidism clear up under pituitary gland. In a personal case there was a striking change in the contour of the hands, ankles, hips, buttocks, thighs and shoulders that could be made to appear or recede by giving or taking away pituitary gland. The effect on the child's disposition was also striking.

According to Pal (Deut. med. Woch., Dec. 23, 1915), pituitary extracts have no effect upon the normal thyroid gland and certain strumas. But when given for the thyrotoxicoses the toxic state improves. He has used the extract in 16 cases of *Graves's disease* and *hyperthyroidism.* The reaction was not the same in all cases. The remedy was first given internally then hypodermically. In 9 cachectic cases with low blood-pressure and deep intoxication, in which no operation could be performed, he obtained a gain of weight in 7. There was also improvement in restlessness, tremor, and outbreaks of perspiration. The tachycardia showed gradual improvement, but returned when the drug was suspended.

R. A. Bate (Louisville Mthly. Jour. of Med. and Surg., Sept., 1915), after using posterior pituitary (pituitrin) in over 1000 cases with *cardiovascular* and *metabolic atony* and *deficient de-*

fensive activity regards pituitary therapeutics as easily the most effective in organotherapy. He cites numerous cases in support of his view.

E. Zueblin (Boston Med. and Surg. Jour., Dec. 24, 1914) recommends pituitrin in *acute heart failure* with *dilatation*. Too large a dose may in the aged result, however, in a sudden harmful rise of pressure. This may entail hemorrhage and apoplexy. A weakened and tired-out myocardium may be rapidly reduced to a normal size.

The same author (Med. Rec., Mar. 3, 1917) obtained excellent results in 2 severe cases of *asthma* from combined hypodermic use of pituitrin and adrenalin, 1 c.c. (16 minims) of each.

In a study of 50 cases in which pituitary gland was administered hypodermically in children, Kahn and Gordon (Annales Otol., Rhin. and Laryn., June, 1915) found that the coagulation time of the blood is materially reduced by the procedure. The *hemorrhage following nasal and throat operations* was much reduced, especially in those on the turbinal bodies. The effect on the blood-pressure was variable, the systolic being increased in 55.31 per cent of the cases, reduced in 36 per cent., and unchanged in 8.5 per cent., and the diastolic increased in 35.5 per cent., reduced in 35.5 per cent., and unchanged in 29 per cent. The pulse pressure was increased in 61 per cent. and decreased in 39 per cent.

Pituitrin, according to S. W. Bandler (Med. Rec., Feb. 12, 1916), has no effect in inducing *labor* but once labor is on the way, whether recognized or not, its action is remarkable. It affords a means of differentiating between true and false labor pains. If the patient is in labor 3 hypodermics produce regular, rhythmical, continued labor pains; if not, small pains may be produced which stop in half an hour or so and do not recur. For inducing labor, if a Barnes bag is introduced into the cervix a few hours later the patient experiences a sensation of pressure; if then pituitary extract is given in small doses and repeated, labor pains come on and labor progresses without difficulty. In dry labor, when given shortly after the membranes rupture, it saves hours of waiting. In labor when the conditions are normal, including the relation between the fetal head and the pelvic bones and the presentation, and when all that is needed is sufficient uterine power, one may use it.

The hypodermic use of pituitrin is considered by the writer an excellent ambulatory treatment for *menorrhagia* or *metrorrhagia* in young girls in whom examination, treatment, or curettage are out of the question. A hypodermic injection may be given every day if possible for days or months. Only rarely are such patients so sensitive that the drug has to be given in small doses. For stimulating the contractions of the bladder the action of pituitary extract was uncertain. In *postoperative* cases, often as a routine procedure, the writer found pituitrin very beneficial in starting intestinal activity as an aid to enemata or drugs given by mouth; repeated hypodermic injections often overcame symptoms simulating *intestinal paresis*.

L. G. McNeile (Amer. Jour. of Obstet., Sept., 1916) states that the following complications have followed the use of this drug in *labor* cases: Post partum uterine atony, fetal asphyxia, maternal collapse, eclamptic convulsions, tetanus of the uterus, premature placental separation, and rupture of the uterus. In his own experience uterine tetanus followed as little as 5 minims (0.3 c.c.) of the extract in 2 instances. A greater tendency to tetanus in primiparæ than in multiparæ was noticed, and in many instances restoration of normal contractions did not follow, a low forceps operation becoming necessary. Fetal asphyxia was likewise noted in many primiparæ, though never fatal. Postpartum atony, with alarming hemorrhage in several cases, was noted, particularly in prolonged labor and in multiparæ in whom several pregnancies had occurred in rapid succession. The drug has no place in normal obstetrics.

As a *galactagogue* R. C. Hughes (Therap. Gaz., May, 1915) employs pituitary extract by mouth with as great confidence as he does ergot to cause uterine contraction after labor. He has noted no unpleasant phenomena from it. Its action proved permanent.

physiology and physiological action of, i. 774

Electric stimulation of the hypophysis in dogs under insufflation anesthesia, gives rise, according to Keeton and Becht (Amer. Jour. of Physiol., Nov., 1915), to an increase in the reducing substances in the blood. This does not occur in dogs whose splanchnic nerves have been previously cut, a fact arguing against the liberation of a hormone which increases the cellular glycogenolysis.

There exists in the posterior lobe of the pituitary body, according to Shamoff (Amer. Jour. Physiol., Jan., 1916), some substance having an action on the isolated intestinal loop resembling the action of epinephrin, and which may be other than that which raises blood-pressure and causes diuresis. It is not constant in the extractives prepared in the usual ways, and may be inconstant in the fresh glands. It relaxes the isolated intestinal loop and inhibits its rhythmic contractions.

E. Goetsch (Johns Hopkins Hosp. Bull., Feb., 1916), in young rats, found that feeding dried *anterior and posterior* extract caused excessive structural and functional development of the sexual organs. Feeding *anterior* lobe alone caused increased weight and greater and more vigorous body-growth and a shortening of the period of complete sexual development by at least one-third. There was increased spermatogenesis. *Posterior* lobe extract did not stimulate general growth nor the sex glands; in fact, it retarded the sex glands.

Blair Bell (Quart. Jour. Exper. Physiol.; Lancet, Feb. 19, 1916) confirmed the conclusions of his predecessors, who had found that complete removal of the whole body or of the anterior lobe was always fatal. The dog remains somnolent, but can be roused for about 24 hours, after which breathing gradually becomes slower, and stops. Incomplete removal of the anterior lobe, insufficient to cause fatal coma, results in genital atrophy. Cushing had stated that partial removal of the anterior lobe gave rise to dystrophia. Bell has never seen this result from removal of pituitary substance, though it was a constant sequel of complete separation of the pituitary from the brain by crushing or section.

Removal of the posterior lobe produced no symptoms. From pressure on the pituitary by a ball of wax, the animal wastes, becomes irritable, and develops glycosuria without other evidence of brain pressure.

The author regards the function of the pituitary as that of the organ as a whole; the secretory material comes from the intermediary cells, themselves derived from the anterior lobe, and these cells and their products invade the posterior lobe, or pars nervosa, when the gland is active.

Pancoast and Hopkins (N. Y. Med. Jour., Feb. 17, 1917), studying the action of pituitrin on the gastro-intestinal tract of man by the X-ray, in 11 cases found in the stomach usually a primary depression of peristalsis or motility, or both, followed by an increase in both. The same effect followed repeated doses. The pylorus and large bowel were influenced very little. In the small intestine motility was as a rule either unaffected or slightly delayed.

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O. J. Stein (Jour. Ophthal. and Oto-Laryn., Aug., 1916) reports a patient on whom he operated for disease of the hypophysis by the transnasal-sphenoidal route. The Hirsch

technique was followed. An adenoma was removed, but no pituitary gland tissue. All the symptoms quickly disappeared, and had remained absent a year after the operation.

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For various plastic restorations C. Higgens (Lancet, Oct. 7, 1916) recommends **celluloid** either in solution in acetone or in a preparation of dissolved celluloid available in shops. Through a small incision the scar is separated from its attachments and the celluloid injected slowly from a strong syringe with screw attachment.

Saint-Martin (Bull. et mém. Soc. de chir. de Paris, xlii, 1668, 1916) has used rubber with success for isolation tubes in cases of liberated nerves.

Excellent results were obtained by H. Morestin (Bull. et mém. Soc. de chir. de Paris, xlii, 1005, 1916) in an extensive shell wound of the face, by successive interventions calculated to reduce bit by bit the extent of the cicatrized surface and the mass of fibrous tissues.

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Morichau-Beauchant (Paris méd., Apr. 7, 1917) describes a special form of tuberculous disease met with often among soldiers. Some had histories of bronchitis, hemoptysis, or pleurisy before the war, but in the majority the disorder had appeared since the beginning of hostilities, always insidiously, and preceding by several weeks at least their admission to the hospital. The early symptoms are gradual loss of strength and appetite, breathlessness, soon followed by cough and a pain in the side. On admission they were pale, with a continuous cough, especially at night, with scanty expectoration, at times blood-streaked, but always free of tubercle bacilli. Dyspnea was experienced even during rest. Especially marked was an incapacity for exertion out of proportion with the condition as a whole. In most instances the condition cleared up in 3 to 6 weeks under rest in warm quarters, cough sedatives, derivatives, and general tonics. The condition is probably not a preliminary stage of common phthisis, but merely a special benign form, purely inflammatory and not resulting in tubercle formation.

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West (Pract., Feb., 1916) asserts that in dry pleurisy **venesection** gives more relief than anything else. If not desirable, strapping is the next best method. Serous effusion should be tapped, but no suction used except by siphonage.

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Dehau and Roux (Paris méd., Nov. 11, 1916) note that even after rib resection and dependent drainage the general condition in some cases of purulent pleurisy remains grave weeks or even months. Antiseptic washings gave little result in such patients, but as soon as **oxygen** was injected through a Nélaton catheter into the pleura, improvement, sometimes extremely rapid, was observed. In a case in which the oxygen insufflations had to be interrupted for 4 days, fever at once returned, only to disappear again when the procedure was resumed. Insufflations lasting 1 hour are practised once or twice daily, under low pressure, to avoid undue expansion.

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Pneumatinuria (pneumaturia).

The finding of gas in the urine is a possibility in the presence of either ulceration of the bladder wall, as by cancer, of a fistula connecting the bladder with the bowel or vagina, or of a wound whereby air may enter the bladder. Gases in the bladder may be formed, moreover, through the activities of the colon bacillus or the B. aerogenes capsulatus. The treatment is that of the causative condition.

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Etiology and Pathology, vii. 538. 540.—It has been commonly assumed

that infection in pneumonia is autogenic. Studies by A. R. Dochez (Trans. Amer. Assoc. of Immun.; N. Y. Med. Jour., Oct. 7, 1916) in normal individuals make it probable that most cases depend on direct or indirect contact with a previous case.

W. E. Robertson (Med. Rec., Apr. 1, 1916) asserts that not infrequently pneumonia develops upon the substratum of a tuberculous process. It develops usually in individuals with a disease focus, if not tuberculous, probably intranasal or an old sinus disease. In some cases beginning apparently as pneumonia treatment of the nose will abort the disease. The nose might be a factor in the development of toxic forms of the organism.

Mathers (Jour. Infect. Dis., Sept., 1916) found that during lobar pneumonia, pneumococci may be excreted in the urine, usually just before or just after the crisis.

In a study of the types of pneumococci in infants and children, A. G. Mitchell (Penna. Med. Jour., Feb., 1917) describes a study undertaken to ascertain if the 4 recognized types of pneumonia organisms (Types I, II, III and IV) are present in infants and children suffering from pneumonia, as in adults. He found that the so-called fixed types of pneumococci are of infrequent occurrence in infants and children as compared with adults. The pneumococci without definite agglutination reactions, and classed as Type IV, are of more frequent occurrence in infants than in adults. The mortality of infants and children infected with the fixed types (I, II, III) seems to be lower than in adults. The fixed types occur at all ages from 6 months to 11 years. Type IV pneumococcus often causes as severe an infection as the fixed types. Type I seems to cause a mild infection. Type IV is the most frequent infecting organism in bronchopneumonia, although the fixed types may also be found. Complications are more frequent with Type IV infection.

Diagnosis, vii. 535.—W. M. Stewart (Amer. Jour. of Roentgenol., iii. 559, 1916) maintains that the *X-rays* are of material aid in differentiating pneumonia and empyema, especially in children. In doubtful cases it may even clear up the diagnosis long before positive physical signs appear. In lobar pneumonia, the shadows usually begin at the lung cortex, and are wedge-shaped, with the apex toward the root. They extend until finally the entire lobe is involved.

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digitalis in, iv. 118, 138, 157; vii. 560

Cohn and Jamieson (Jour. Exper. Med., Jan., 1917) in a series of 105 cases of pneumonia, found that digitalis, given by the mouth, influenced the heart just as in the non-febrile heart.

disinfection of sputum in, vii. 546
ethylhydrocupreine hydrochloride in, vii. 560

From experience in 32 cases Chesney (N. Y. Med. Jour., Feb. 3, 1917) believes there is no doubt that **ethylhydrocupreine** or **optochin,** a derivative of hydroquinine, exerts a curative action in pneumonia. During the first 24 hours he gives an initial dose of 0.45 Gm. (7 grains) of optochin, followed at 3-hour intervals by 0.15 Gm. (2⅓ grains). In the second 24 hours the drug can be given in 10 doses of 0.15 Gm. (2⅓ grains). It is best given in capsules. Among 786 cases of pneumonia treated with this drug there has been 1 instance of permanent blindness, with temporary impairment of vision in 4 per cent. of the patients.

Experiments by Kolmer, Cohen and Steinfeld (Jour. Infect. Dis., Mar., 1917), suggest that a part of the curative effect of **quinine and urea hydrochloride, ethylhydrocupreine,** and other cinchonics in pneumococcus infections is due to their influence on phagocytosis.

fresh air in, vii. 545, 558

J. P. Crozer Griffith (Jour. Amer. Med. Assoc., Jan. 1, 1916) points out that it never has been proved that cold, fresh, or open air for pneumonia or other respiratory diseases is the correct measure. Excessive use of cold air has been a fad, and has gone into the hands of nurses, hospital managers, and the laity. If among medical men there is doubt concerning the cases in which this treatment may be used, certainly it is not safe in other hands.

L. E. Holt (Jour. Amer. Med. Assoc., Jan. 1, 1916) emphasizes the importance of quarantine of the infant when other members of the family have colds. This particularly obtains in premature infants. There have been almost as many deaths caused by cold air as cures effected.

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J. H. Musser, Jr., and H. K. B. Hufford (Jour. Amer. Med. Assoc., Apr. 28, 1917) secured prompt relief of delirium in 7 severe cases of pneumonia by **lumbar puncture** and removal of spinal fluid until the pressure was reduced to normal.

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Wadsworth (Jour. Infect. Dis., Oct., 1916), in a study of the action of various mouth washes upon the pneumococci, found the most effective to be one containing 30 per cent. of **alcohol** combined with **glycerin** in an isotonic solution of **alkaline salts.**

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A. Graham-Stewart (Pract., Apr., 1917) urges the importance of mental and physical rest, with absence of worry, such as the anxious-looking relative, and the mention of the word "pneumonia." He considers persistent insomnia one of the worst prognostic signs; general exhaustion is produced, with lowered vasomotor tone. Its cause may be cough, pain, an uncomfortable bed, nervous tension, general discomfort, or restlessness.

rubbing with coarse towel in, vii. 546
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Cole (N. Y. Med. Jour., Feb. 3, 1917), from a study of pneumonia at the Rockefeller Institute, asserts that the use of **immune serum** against in-

fection with organisms of Type I gives very gratifying results.
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W. E. Robertson, C. P. Brown and A. G. Beckley (Trans. Amer. Assoc. of Immun.; N. Y. Med. Jour., Oct. 21, 1916) tried serobacterins intravenously in a series of cases. Of 11 cases, some received a polyvalent bacterin composed of sensitized pneumococci alone, others a mixture of sensitized pneumococci, streptococci and staphylococci. Those receiving the mixed bacterin reacted with a chill and a rise in temperature. Of the 11 cases, 10 ended in prompt recovery. The eleventh died of nephritis.

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The literature tends to suggest that this secretion, if such exists, exercises a powerful stimulating action upon the testicles, spermatogenesis, and the act of copulation by causing penile vasodilation. Complete removal in dogs has been found to arrest spermatogenesis and the formation of the transition forms of sperm cells. Dubois and Boulet (C. R. de la Soc. de Biol., vol. lxxvi, 1912) found that extracts powerfully stimulated the contractility of the bladder. This was confirmed by Battez and Boulet (*ibid.*, vol. lxxiv, 1913). The depressive phenomena following prostatectomy would tend to show that the secretion also possesses some stimulating power over the organism at large.

In a previous paper P. Thaon (Bull. de l'Acad. de méd., Nov. 16, 1915) had called attention to the extreme toxicity of prostatic extracts. Bazy had noted that although drainage of the bladder in prostatic hypertrophy with retention of urine caused considerable improvement, certain toxic symptoms persisted which disappeared only after prostatectomy. Thaon attributes this toxicity to labile fats or lipoids sometimes seen in the periphery of the organ to be passing into the emergent vessels in the form of small fatty globules, as though a true internal secretion.

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According to Kretschmer and Gaarde (Jour. Amer. Med. Assoc., June 24, 1916), chronic colon pyelitis notoriously resistant to medical treatment, may be treated with excellent results by combined internal medication and local lavage. The first week he gives 1 teaspoonful of **sodium bicarbonate** 3 times daily to alkalinize the urine. Then for a week **acid sodium phosphate** is given to acidify the urine, with 30 to 70 grains (2 to 4.5 Gm.) daily of **hexamethylenamine.** These weekly periods are alternated as often as needed. Simultaneously the renal pelvis is irrigated through a small ureteral catheter with a 1 per cent. **silver nitrate** solution. Treatment is continued until repeated cultures of ureteral specimens are sterile. Recurrence is probable if treatment is not also directed to bladder infection. About 5 to 10 c.c. (1¼ to 2½ drams) of the solution are used for each irrigation, at intervals of 5 to 10 days.

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 in children.

W. C. Quinby (Jour. Amer. Med. Assoc., Feb. 24, 1917) advocates frequent determination of the reaction of the urine in terms of its hydrogen ion concentration, also the requisite concentration for the growth of the infecting organism.

The treatment should aim to render the urinary hydrogen ion concentration least suitable for the growth of the organism present, by oral use of **citrates** or **benzoates.** In the few cases not thus controlled he advises injection of the renal pelves with ½ to 1 per cent. **silver nitrate.** This is readily done through the urethra in female children. In males it may be done through a perineal incision, combined with dilatation of the bladder sphincter.

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Cabot and Crabtree (Surg., Gynec. and Obstet., Nov., 1916) emphasize that an accurate diagnosis of the infecting organism is of distinct significance in the treatment of renal infection. The colon group of bacteria produce essentially non-surgical conditions except when seen late as pyonephrosis. In the early stages they are distinctly amenable to formaldehyde-containing drugs. On the other hand, a coccus infection is essentially surgical. A few heal spontaneously, but where abscess formation results, surgery is imperative.

In non-surgical infection of the kidneys and ureters, G. J. Thomas (Urol. and Cutan. Rev., xx, 127, 1916) advises a **careful search for foci of infection** such as tonsils, teeth, abscesses, furunculosis, bone infections, etc., before urologic treatment is instituted. In the local treatment, **lavage** of the **renal pelvis** and **ureters** every 4 or 5 days is most frequently used, with 0.5 to 3 per cent. silver nitrate. Autogenous vaccine and urinary antiseptics are also given. Of 150 cases, 46 per cent. were thus improved and 18 per cent. more cured.

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Downes (Surg., Gynec. and Obstet., Feb., 1916) considers partial pyloroplasty the operation of choice in pyloric obstruction in infants. He recites its many advantages over gastroenterostomy, and reviews the results in 66 personal cases. The time required for partial pyloroplasty is less than ½ that required for gastroenterostomy, and the obstruction is permanently removed.

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L. G. Cole (Interst. Med. Jour., xxiv, No. 1, 1917) states that serial röntgenography reveals the extent of the progression or retrogression of pathology in postpyloric ulcer, and with the clinical progress gives a definite indication in the choice between medical and surgical treatment.

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Aviation sickness is attributed to rapid changes or altitude, whereby the differences in air pressure give rise to headaches, tinnitus, and dyspnea. A suffering aviator lands in a state of complete mental and physical collapse; he complains of almost intolerable headache, but relief usually ensues on account of the deep sleep into which he automatically falls. The condition has been regarded as an exact inversion of caisson disease. It is common for an aviator to come downward from a great height at a speed often exceeding 100 miles an hour. This change in pressure may produce effects precisely similar to those due to excessive pressure when diving in water (Indianapolis Med. Jour., Mar., 1916).

According to Ferry (Presse méd., Jan. 6, 1916), from 60 personal observations collected after ascents in various types of airplanes, rapid pulse depends both upon variations in altitude and the subjective sensations of the aviator. The constant hypotension observed may explain in some degree vertigo and faintness during flight; whence the need of making gentle ascents and descents to avoid cardiovascular strain.

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Swift and Kinsella (Arch. of Internal Med., Mar., 1917) studied streptococci isolated from the blood of 58 patients with typical acute rheumatic fever and polyarthritis, all responding characteristically to salicylates. All of the cultures of joint exudates remained sterile. Their results as regards the blood seem to indicate that no type of streptococcus has been constantly associated with acute rheumatic fever. The etiologic relationship has not been definitely proved. If the streptococcus is the etiologic agent, the infection is through various members of the viridans group.

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R. Pemberton (Amer. Jour. Med. Sci., May, 1917) found it possible to relieve patients of practically all symptoms of diffuse arthritis by a large curtailment of carbohydrates, with increase of fats sufficient to make up or exceed this caloric deficit. With the protein intake approximately constant some such patients actually gained weight while convalescing. Apparently carbohydrate plays an injurious part in the disease.

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      Lorrain Smith and Ritchie (W. Lond. Med. Jour., July, 1916) report 2 cases treated by intravenous injec-

tions of eusol, a 0.5 per cent. solution of free hypochlorous acid, prepared by shaking 25 Gm. (6¼ drams) of a mixture of equal parts of chloride of lime and boric acid in a liter (quart) of water and then filtering. For intravenous injection, 8.5 Gm. (2⅛ drams) of salt are added; 100 to 120 c.c. (3⅓ to 4 ounces) were given. Results were favorable, the temperature in 1 case falling from 106° to 96° F. (41.1° to 36.6° C.) in 12 hours.

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G. I. Baradulin (Russky Vratch, xv, No. 35, 1916) gives nourishment in an easily assimilated form, using a 30 per cent. solution of **grape sugar** instead of salt solution for subcutaneous or intravenous injection. He injects into a vein 250 or 300 Gm. (8 to 10 ounces) of it, repeating it in the severer cases to a total of 2 or 3 times a day, and keeping this up at need for 3 or 4 days. The sugar solution also has a strong diuretic action, but its chief value is in nourishing the heart.

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In shell shock E. T. C. Milligan (Brit. Med. Jour., July 15, 1916) ad-

ministers chloroform slowly, in a quiet room and apart from other patients. Under a suitable degree of anesthesia, **suggestion** is carried out and continued until full recovery of consciousness. When quite rational the man is assured of his cure, promised a rest, given **morphine**, and allowed to sleep. Cases of loss of memory, speech, or hearing, hysterical attitudes, and loss of function are thus successfully treated.
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Cranioplastic operations in 18 skull injuries, 9 with aluminum plates, 1 bone-flap, and 8 cartilaginous reparations according to Morestin's method, caused P. Duval (Bull. et mém. Soc. de chir. de Paris, xlii, 611, 1916) to abandon the metal plates.

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Observations on 106 cases of cranial injuries led R. Whitaker (Brit. Jour. Surg., iii, 708, 1916) to conclude that under good conditions every case of fractured skull should be operated on within 3 days after admission. If received after 14 days it is probably best not to operate unless there be definite clinical manifestations of increasing intracranial mischief. Meanwhile certain conditions may demand immediate operation: active septic processes in a badly drained wound; evidence of cerebral irritation or compression; coma and slow pulse.

Severe complications, according to André Martin (Paris méd., Dec. 9, 1916), may follow apparently insignificant injuries of the head by small shell fragments. In cases of small head injuries which manifest mild or severe bone or brain disturbances after apparently healing, even several weeks after the wound, no time should be lost, but the bone and dura at once explored. In fact, it seems advisable to inspect the skull, if necessary enlarging the scalp opening with the knife, immediately after even the mildest scalp wounds.

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James Collier (Lancet, Apr. 1, 1916) notes that severe indirect injuries of the spinal cord may occur from the bursting of high explosive shells when the back is turned without any external detectable bone lesion, or even bruising of the soft tissues.

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In either prevention or treatment of bladder infection in cord lesions J. W. Thomson Walker (Lancet, Feb. 3, 1917) advises either repeated use of the catheter, the tied-in catheter, or suprapubic drainage. The bladder should be irrigated with non-irritating fluids through a small catheter from a low elevation. *Extreme alkalinity* of the urine is common, and an excellent wash is acetic acid in water, 1 in 125. If thought necessary, **potassium permanganate**, 1 to 8000, or **silver nitrate**, 1 to 10,000, may be used. **Sodium bicarbonate, potassium citrate or acetate**, or the **alkaline diuretic waters** may be given by mouth, for cases with *hyperacid urine,* or **acid sodium phosphate** or **sodium benzoate** for *alkaline urine.* The intense cystitis is improved in its early stages by **sandalwood oil. Vaccine** treatment is also of value.

F. Erkes (Münch. med. Woch., No. 7, Feb., 1916) reports a case in which the bladder was emptied by uniform pressure applied on all sides of the vesical region, catheterization, with its dangers, being thus avoided. Pathological changes in the bladder walls contraindicate the measure.

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All *ligamentous* sprains of the spine, F. E. Pierce (Surg., Gynec. and Obstet., xxiii, 332, 1916) points out, require **rest and support** for the spine, while *muscular* sprains, after a short period of rest, should have **massage** and be given some moderate and gradually increasing **gymnastic exercises.**

  - **plaster-of-Paris corset** in, viii. 295
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J. T. Rugh (Amer. Jour. Orthop. Surg., xiv, 71, 1916) enumerates 6 advantages for the bone-grafting operation, viz.: Fixation in less than a year; nature more rapidly fills or solidifies the diseased area; an abscess will usually disappear without tapping or opening; very low mortality; manipulations usually all done in healthy tissues; economic advantage to the wage earner. He deems the operative fixation the treatment of choice for spinal caries and certain other conditions, especially in cases past 12 or 14 years of age. He reports 40 operations with 74.3 per cent. of excellent results.

M. S. Henderson (Surg., Gynec. and Obstet., May, 1917) states that in the Mayo Clinic, from July, 1912, to July, 1916, 274 cases of tuberculosis of the spine were observed. Of these 81 were operated on, 74 according to the method of Albee and 7, that of Hibbs. Of 73 cases forming the basis of Henderson's percentages, 31 (42.4 per cent.) were cured; 33 (45.2 per cent.) were classified as relieved, though some of this group were expected to go on to a cure later. Although there were no operative deaths, 7 patients (9.5 per cent.) were known to have died later. Neither the Hibbs nor the Albee operation is in any sense a radical operation for extirpation of the disease. The patients should be in good general condition. Paraplegia *per se* is not a contraindication.

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Guillain and Barré (Presse méd., Nov. 9, 1916) lay stress on the following fatal complications of spinal wounds in military practice: Purulent meningitis; disturbances of sympathetic innervation in the abdominal viscera and ductless glands resulting in cachexia from failure of assimilation; and anemia of the cerebral centers and medulla. Cervical spinal wounds are the gravest, entailing maximal sympathetic disturbances. All spinal wounds should be explored within a few hours. Foreign bodies should be removed, and the wound treated by free irrigations with warm saline solution. All operative work should be done in very warm rooms. Local anesthesia is very advisable. A dura untorn should never be opened, even if subdural or intraspinal hemorrhage is suspected. If it is torn and the spinal tissue visible, prolonged washing with warm saline solution is indicated. In the first few days or in the terminal stage saline or glucose hypodermoclysis, often with 1 c.c. (16 minims) of adrenalin solution added, is useful.

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In gunshot wounds of the spine Donald Armour (Lancet, Apr. 8, 1916) recognizes the following indications for operation: (1) To relieve pressure from depressed or displaced bone fragments; (2) from blood-clot or extensive hemorrhage, extra- or intra- dural; (3) to prevent further destruction from edema by enlarging the constricted bony canal; (4) to remove the future danger of pressure from exudate and inflammatory thickening.

A. J. Hull (Brit. Med. Jour., Apr. 22, 1916) holds that the majority of gunshot injuries to the spine require excision of the wound and exploration at the earliest favorable opportunity. Hexamethylenamine should be begun as soon as possible. If a missile and severe pain are present, immediate operation is indicated.

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T. Rovsing (Hospitalstidende, Feb. 21, 1917) notes that in malaria and leukemia the results of splenectomy have been discouraging. In *polycythemia, Banti's disease,* and *hemolytic jaundice,* however, they were more promising.
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Diagnosis.—The fact is emphasized by Boas (Arch. f. Verdauungskr., xxii, Nu. 2 u. 3, 1916) that whereas in gastric carcinoma occult bleeding is persistent, in ulcer the blood disappears rather quickly; there is also a difference in the intensity of the

bleeding. Examination of the feces alone with regard to occult blood is therefore not sufficient; the stomach contents should also receive great consideration.

The Wolff-Junghans test is of great value in the diagnosis of gastric carcinoma, according to Friedenwald and Kieffer (Amer. Jour. Med. Sci., Sept., 1916), but only when there is absence of free hydrochloric acid, and then only in the absence of even traces of blood, of all food residue, and of swallowed saliva or sputum. Positive reactions are rare in simple achylias, while frequent in cancer.

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Diagnosis.—J. Lépine (Bull. de l'Acad. de méd., Paris, May 8, 1917) asserts that while vigorous mercurial treatment has steadily decreased the incidence of tabes, the last 3 years seem to have been attended by increasing frequency and severity, with shorter intervals between the infection and symptoms being also less prolonged. Shell shock may cause symptoms resembling those of progressive paralysis. In some such instances arsenobenzol was given with disastrous effect.

W. F. Schaller (Jour. Amer. Med. Assoc., Jan. 20, 1917), from a study of 150 cases of tabes, found one of the earliest pathologic changes to be a syphilitic leptomeningitis of the cord on its posterior aspect, thus bearing a direct etiologic relation to the degeneration of the posterior columns. It induces a multiple symmetrical radiculitis with pain and paresthesias; impairment of superficial and deep sensibility; loss of the Achilles reflex; increased spinal cell count and globulin content, and a positive spinal Wassermann reaction. Further very early signs are anisocoria, pupils of irregular contour, and diminished hearing. Cardiovascular disease, especially aortic, and general glandular enlargement are very constant early signs.

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Eisendrath (Annals of Surg., Sept., 1916) urges that true non-descent or ectopic descent of the testis be operated at the earliest possible age, the lower limit being about 2 years. Atrophy of the spermatogenic cells occurs in about 90 per cent. of cases of retained testis. Hypopituitarism is an independent and not infrequently accompanying condition. The operation for non-descent has little influence on this lack of development of the sexual characteristics, and one should be guarded in the prognosis for such cases, as well as in the possible development of the testis after operation in young adults.

Among 30 operations for undescended testicle reported by Mixter (Boston Med. and Surg. Jour., Nov. 2, 1916) there was atrophy in 8 cases following operation. The one factor present in each of these cases was an interference with the spermatic circulation at the operation. These vessels should be left intact.

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    Leishman and Smallman (Lancet, Jan. 27, 1917) place the methods of administration of tetanus antitoxin in the following order as to efficiency:

intramuscular, subcutaneous, intrathecal, and intravenous. The latter should not be used, entailing a risk of anaphylactic shock, and being of little therapeutic value. By the combined subcutaneous and intramuscular routes the daily dosage for the first few days should not fall below 10,000 units.

Danger from anaphylactic shock is said by Browning (Brit. Jour. Surg., July, 1916) to be avoided by the following method: 5 c.c. of antitoxic serum are diluted with 50 c.c. of warm saline. 1 c.c. of this is run into a vein; 4 minutes later 3 c.c. are run in; 2 minutes later 10 c.c.; 2 minutes later again 25 c.c., and after a pause of 10 minutes the remainder is injected. After this the intrasternal and intramuscular injections may be made without further special precaution.

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A. Lumière (Ann. de l'Inst. Pasteur, 1917) shows that the duration of the prophylactic properties of tetanus antitoxin depends upon the ratio of toxin to antitoxin in the body. The post-antitoxin cases appear due to excess of toxin in the wound and to liberation of spores through surgical intervention or a traumatism, after the activity of the antitoxin has ceased. Hence the necessity of **carefully cleansing wounds and removing all foreign bodies** besides **injecting antitoxin anew** whenever a secondary surgical intervention becomes necessary. For the painful spasms he found **sodium persulphate** efficient.

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In the home military hospitals in England (Editorial, Lancet, Jan. 20, 1917), during the year ending July 31, 1916, according to Sir David Bruce, 195 cases of tetanus were received, of

which 96 died. A prophylactic injection of serum being given at the front in every case of gunshot wound, protection by a single injection is evidently not complete. Highly concentrated serum in doses sufficient to maintain protection, such as 3 c.c., may be repeated weekly as long as seems advisable, without fear of anaphylaxis.

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M. Foster (Brit. Med. Jour., Feb. 10, 1917) reports 3 cases of delayed onset of tetanus following gunshot wounds of bone. The periods of incubation were 86, 106, and 146 days.

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Among 1672 operations for goiter reported by G. W. Crile (Med. Insur. and Health Conservation, Feb., 1917), 67 were for malignant growths. Two striking facts were shown: (1) 90 per cent. of these cancers occurred in fetal adenomata; (2) in certain fetal adenomata, benign and cancer growths could not be differentiated by the microscope. Thyroid cancer is cured only in its early stages. Ten per cent. of fetal adenomata being malignant, their tendency to malignancy must be seriously reckoned with. When the cancer involves the trachea there is virtually no hope.

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The study of Kendall (Boston Med. and Surg. Jour., Oct. 9, 1916) tended to show that the active constituent of the thyroid gland is contained in alpha-iodin, a crystalline compound. There appears to be no other substance in the thyroid secretion which acts directly. This substance, even in very small amounts, will supplant thyroid activity, relieving myxedema and cretinism, and in excess will produce symptoms simulating exophthalmic goiter.

B. R. Shurly (Jour. Amer. Med. Assoc., Dec. 9, 1916) deems it obvious that the functions of the thyroid and other ductless glands are profoundly affected by toxic disturbances, especially those entering the tonsillar chain of lymphatics.

W. M. Boothby (Boston Med. and Surg. Jour., Oct. 19, 1916) asserts that whereas the basal metabolism of normal individuals rarely varies more than 10 per cent., any marked variations are to be ascribed to changes in the endocrine organs. The thyroid furnishes the most marked increase and decrease. In exophthalmic goiter the diagnosis can thus be made in doubtful cases, and the effect of treatment ascertained by successive determinations. The necessary length of rest after thyroidectomy is accurately shown.

Krogh (Ugeskrift f. Laeger, Dec. 29, 1916) found in 1 case of exophthalmic goiter the standard metabolism 80 per cent. above normal, and in a myxedema patient 40 per cent. below normal.

[I pointed out this potent influence of the thyroid secretion on metabolism with ample direct and collateral proof in 1903. C. E. de M. S.]

Marine and Rogodd (Jour. Pharm. and Exper. Therap., Oct., 1916) found that after an injection of 50 mg. of potassium iodide into the circulation,

definite histologic changes (always involutionary) in the thyroid can be detected within 20 hours in favorable cases. The more marked the hyperplasia the more readily they are detected.

Burge, Kennedy, and Neill (Amer. Jour. of Physiol., June, 1917) found that thyroid feeding increases the catalase of the blood while decreasing it in the heart and probably in the fat and skeletal muscles. The increased blood-catalase may account for the increased oxidation in animals to which thyroid is fed.

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M. C. Smith (Boston Med. and Surg. Jour., Oct. 19 and Nov. 9, 1916) asserts that thyroid insufficiency often underlies irregular, delayed, and erratic dentition and decayed teeth in children. Administration of thyroid is markedly effective especially in delayed dentition and children bordering on cretinism. He invariably starts to regulate the teeth of a young child by giving thyroid.

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Indications.—Tonsillectomy, or complete removal of the tonsils, is now undertaken not only for recurring acute tonsillitis or peritonsillitis, but for ear disease, arthritis, muscular rheumatism, chorea, tuberculosis, cervical adenitis, goiter, anemia, torticollis, and even nephritis, peptic ulcer, multiple neuritis, and vascular hypertension. Some, like Higginbotham (N. Y. Med. Jour., Apr. 29, 1916), are advising and successfully carrying out tonsillectomy even in the presence of acute inflammation, to obviate the manifold possible complications.

In 24 of 31 cases in which Crowe, Watkins, and Rothholz (Bull. Johns Hopkins Hosp., xxviii, 1, 1917) removed the tonsils for *infectious arthritis,* the joints were normal at the last examination. In some they were much worse for a few days, but began to improve after 2 or 3 weeks. Four cases were merely improved, 2 unimproved, and 1 became worse. Of 9 cases of *rheumatoid arthritis,* only 2 were improved by tonsillectomy, and 5 were much worse. In each of 4 cases of *myalgia* or *myositis* the trouble disappeared after tonsillectomy. Of 25 cases of acute *rheumatic fever* tonsillectomized, 4 had recurrence after the operation. Of 23 cases of *Sydenham's chorea,* 8 had a recurrence. In 122 of 366 cases of *enlarged cervical glands,* there were no palpable glands after tonsillectomy; in 187 cases the glands in the anterior triangles were not larger than peas; in 36 they were still enlarged, and in 21 they were definitely tuberculous. Tonsillectomy alone will not cure a tuberculous cervical adenitis, arthritis, or glomerular nephritis. In these cases one must carry out all general measures to increase the resistance to infection.

Wherever tonsillectomy is contemplated, one must first determine whether the tonsil infection is localized or is secondary. If there is any marked nasal obstruction, sinus infection, alveolar abscess, or extensive pyorrhea, these should first be remedied before the tonsil operation is undertaken.

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The serious disadvantages of various local anesthetic drugs, including novocaine, are pointed out by M. S. Ersner (N. Y. Med. Jour., Jan. 6, 1917), who recommends the following safer procedure: The anterior and posterior tonsillar pillars are *swabbed* with a 10 per cent. **cocaine** solution, the swab being very thin and thoroughly squeezed. About 2½ to 3 drams (10 to 12 c.c.) of freshly prepared and sterilized **normal saline solution** are then injected back of each tonsil: superior and inferior poles, 1 injection each; anterior pillars and posterior pillars 2 injections each. In buried tonsils one may pull the tonsil forward with the tenaculum to inject. When infiltration is perfect, the tonsil bulges out and pales owing to retrotonsillar pressure. Tonsillectomy was thus successfully effected in 72 patients. Postoperative sloughing is avoided, and most patients can take food without difficulty within 24 hours.

[Skillern and Ridpath, of Philadelphia, use a 0.1 per cent. **cocaine hydrochloride** solution, with a few minims of 1:1000 **adrenalin** solution added in each ounce (30 c.c.). Three injections are made at different levels between the anterior pillar and tonsil, a fourth at the upper end of the tonsil, and a fifth posteriorly. Infiltration of the tissues outside the capsule is thus effected.]

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Technique.—An increasing number of specialists are adopting for the average case such instruments as the Sluder and Sluder-Ballenger guillotine. The so-called "bloodless" operation of tonsillectomy is being performed with the **hemostat tonsillectome** of La Force (Laryngoscope, Jan., 1915) or the similar instrument devised by Hill and Elphick (Jour. of Laryngol., Rhinol. and Otol., Dec., 1914). These instruments have two blades, the one blunt, to crush the stump of the tonsil until complete hemostasis is induced—one to two minutes or more—the other sharp, to sever the tonsillar attachment when the hemostasis has been secured. The tonsil is fed and inverted into the rectangular loop of the instrument with the finger before these blades are driven home. Little or no blood is lost.

[The operation is facilitated by the use of a bilateral mouth-gag carrying a small electric bulb which illuminates the mouth, and by the use of an electrically driven suction apparatus, blood and mucous secretions being almost instantly removed. Thus Skillern, for greater safety in the event of secondary hemorrhage, provides the attendant in each case with an ampoule of **pituitrin,** to be injected (in the full dosage, whatever the patient's age) if marked bleeding occurs. **Coagulose,** a preparation of fibrin, has also given satisfactory results in his hands. L. T. de M. S.]

D. C. Balfour (Annals of Surgery, Mar., 1915) of the Mayo Clinic, dispenses with the snare entirely, dissecting loose in succession the anterior and posterior pillars—with blunt scissors, tissue forceps, or blunt dissector,—enucleating the superior pole from the supratonsillar fossa, and finally rolling the tonsil out of its fossa by blunt dissection or, if necessary, with dissecting scissors.

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Etiology, vii. 414.—Extensive epidemics of septic sore throat encountered in 1913 in Chicago, Boston, and Baltimore, characterized mainly by tonsillitis and marked cervical adenitis, were traced, according to J. A. Capps (Jour. Amer. Med. Assoc., Sept. 6, 1914), to a single source of milk supply in each city, the infecting organism being a hemolytic capsulated streptococcus from the udders of cows with mastitis. The latter may possibly itself originate by transmission of human streptococci to the cow from the milker.

Complications.—Among the early complications of acute tonsillitis, W. D. Hoskins (Indianap. Med. Jour., Sept., 1916) lays stress on acute endocarditis; children with acute tonsillitis should be kept in bed until fever has subsided and all evidence of the acute disease passed. H. B. Mills and G. A. Sowell (N. Y. Med. Jour., Apr. 15, 1916) report a case of pyelocystitis immediately following, and believed due to, acute tonsillitis in a boy aged 2 years, and refer to another similar case. In the epidemics discussed by Capps (*loc. cit.*) otitis media, paratonsillar abscess, and erysipelas were common sequels. Arthritis, endocarditis, and myocarditis were also frequent; pleurisy and pneumonia often ended in fatal sepsis, and peritonitis caused a number of deaths.

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Acute streptococcic sore throat responds quickly, according to R. R. Mellon (Med. Rec., May 15, 1915), to certain strains of stock vaccine organisms. If such a useful strain is not available an autogenous vaccine will serve as an inferior substitute.

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    Diagnosis.—R. R. Mellon (Med. Rec., May 15, 1915) states cultures from the tonsillar crypts and animal inoculation may clear up the diagnosis in many obscure infections. T. R. French (N. Y. Med. Jour., cii, 961, 1916) has described a procedure, termed *internal tonsilloscopy,* in which by means of a lens tube speculum, or tonsil microscope, and a small electric lamp placed behind the tonsil in various situations, the tonsil is transilluminated and its pathologic conditions rendered directly visible while still *in situ.* The greater its disease, the less translucent it becomes. The normal tonsil exhibits a "rock-candy" coloration, while in the first grade of disease diffuse or localized reddening is seen. Superficial abscesses show as dark or black discs, while in the fourth group, deeper bodies of pus or detritus are seen, wth surrounding localized hyperemia. In the fifth class, there is diffuse, light hyperemia indicating general disease, and in the sixth, the coloring is of the deepest shade, showing widespread detritus and pus. It is held that by this method the inner wall of a *peritonsillar abscess* can be easily mapped out.
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    light therapy in, vi. 361; see also Quinsy, this Index.
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      To relieve dysphagia in *quinsy,* Hinsberg (Mthly. Cyclo., Dec., 1913) recommends 5 to 6½ grains (0.3 to 0.4 Gm.) of dry **orthoform** or anesthesin. A few swallowing movements, without admixture of saliva, will bring it in contact with the affected parts.
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      Duane (Arch. of Ophthal., xlv, 33, 1916) cites a case of head tilting due to the effort to avoid diplopia, with relief by tenotomy of the overfunctioning muscle—the inferior oblique in this instance—of the secondarily deviating eye.
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      According to B. M. Bernheim (N. Y. Med. Jour., June 16, 1917), sodium citrate transfusion is the ideal method. The ability to remove the blood, keep it in a flask for hours, and then take it to a distant bedside and give it as an infusion, is a great advance. Citrate blood is equal to whole untreated blood. The only drawback is the chill and fever following about 1 of every 3 transfusions. This never affects the disease nor the result of transfusion.
      To obviate toxicity, E. Hédon (Presse méd., Mar. 5, 1917) advises the use of defibrinated blood several hours old. The further addition of sodium citrate seems to do away with the least tendency to toxicity. An additional precautionary measure is to start with a small hypotoxic injection, half an hour before the main injection.
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Trench fever.

Trench fever as described by Hurst (Lancet, Oct. 14, 1916) occurs only among the officers and men living near the trenches and in the personnel of hospitals. Actual residence in trenches is not an essential factor. A similar disease has been observed by Ramsay (Brit. Med. Jour., Feb. 17, 1917) in the training camps of England in men never in the trenches and not infected with lice.

Etiology.—McNee and Renshaw (Brit. Med. Jour., Feb. 12, 1916) found that it can be transmitted to healthy men by intramuscular or intravenous injection of the blood of patients. The red corpuscles have the same effect, but not the plasma or serum. One attack does not protect against reinfection. No fatal cases have occurred. The virus seems to be contained in the red cells or leucocytes. The only constant blood change is punctate basophilia. Evidence as to the method of propagation seems to point to lice; cold, wet, and fatigue seem to excite it in subjects infected but showing no symptoms.

Houston and McCloy (Lancet, Oct. 7, 1916), in bacteriological studies, noted a frequent association between the enterococcus and trench fever and allied conditions. The organism was isolated from the blood, urine, sputum, or pus of wounds in a large proportion of cases. In 1 type there was a general septicemia, with symptoms closely resembling typhoid. A second type was that known as trench fever, and the third showed severe myalgia. The etiological relation was proved by frequent isolation of the germ from the blood and other fluids, its opsonic reactions, its specific reaction as a vaccine, and its therapeutic effects.

Symptoms.—Hurst found the incubation period to be from 15 to 25 days. Malaise may precede. The patient then complains of severe headache, backache, and leg pains, shivers, and often sweats profusely. The onset is sometimes very abrupt, with dizziness and dyspnea. In the brief form, the temperature rises rapidly up to 102° to 104° F. (38.9° to 40° C.) and on the third or fourth day suddenly falls. The pulse rate is but slightly increased. In the long or periodic type, the temperature rises to between 101° and 104° F. (38.3° to 40° C.) on the first evening, and the pulse is usually accelerated in proportion. This initial attack is variable in duration. The patient is then well for 2 to 10 days. Here the general symptoms reappear, though less severely. Recurrence follows periodically, with the maximum temperature always in the evening. A certain diagnosis is made only by the temperature chart, but the association of pyrexia with tender shins is very suggestive. Malaria and relapsing fever should be excluded. The total duration of the periodic type is usually between 4 and 6 weeks. All cases should be isolated and the bedding and clothes disinfected.

Treatment.—Nothing is known to prevent the periodic return of attacks. Some relief from pain may be obtained through **aperients** and **hot applications**. According to Ramsay, vaccines made from the enterococcus are of decided value.

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The antigen for the complement fixation test used by H. R. Miller (Jour. Amer. Med. Assoc., Nov. 18, 1916) is made by grinding dead or living tubercle bacilli with table salt and bringing the suspension to isotonicity with distilled water. By this test, with other diagnostic measures, the existence of persons was discovered who are apparently tubercle bacilli carriers without evidence of active lesions.

Bushnell (S. W. Med., May, 1917) states that among 984 *röntgenograms* of different patients at Fort Bayard, 394 showed *paravertebral tuberculosis* as a marked feature. Only 2 cases of strictly apical tuberculosis were found. Eighty-two showed paravertebral tuberculosis alone (thickened lines with studding extending toward or to the apices). Thirty-nine of the latter had not reached the apex. Forty-five of the 82 cases of paravertebral tuberculosis gave no definite physical signs.

P. Raymond (Presse méd., May 5, 1917) cites several cases in which the sudden appearance of sciatica, zona, psoriasis or nodular erythema was followed by pulmonary tuberculosis. Each testifies to the injury of some nerve or nerves by toxins of bacilli, usually tubercle bacilli.

Sajous (N. Y. Med. Jour. Sept. 1, 1917) holds that atrophy or defective development of the thyroid is commonly observed in persons predisposed to tuberculosis and other infections. The prominence of Adam's apple in many such subjects is due to the flat thyroid. The small thyroid is often traceable to infectious diseases. Insufficiency of the pancreas and adrenals also causes one of the most marked early symptoms of tuberculous infection, loss of strength or chronic fatigue.

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John Ritter (Ills. Med. Jour., Feb., 1917) gives tincture of **iodine** in sweet milk in progressively increasing doses; from 60 to 100 drops may be given 3 times a day for many months. When given in milk it never produces iodism or gastric disturbance.

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The results obtained by **prolonged rest** are remarkable, according to J. H. Pratt (Trans. Amer. Med. Assoc.; N. Y. Med. Jour., June 9, 1917). He characterizes tuberculosis as a disease of nervous unbalance, chronic infection, and physical deterioration.

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W. Meyer (Med. Rec., Jan. 27, 1917) simultaneously gives **Koch's old tuberculin** (O. T.), **bacillary emulsion** (B. E.), and **Denys's bouillon filtrate** (B. F.). The injections are made twice a week, alternating the 3 tuberculins. The average case requires from 70 to 90 injections, and the combination is better tolerated than the single tuberculin.

Combe (Le Nourrisson, v. Jan., 1917, from Jour. Amer. Med. Assoc.) advocates a systematic **tuberculin** treatment of tuberculosis in infants. If the dose injected subcutaneously is adapted to the assimilating power, there is a general immunizing reaction in addition to a focal cicatrization reaction. Excessive dosage induces anaphylaxis. He begins with 1/10 milligram and increases the dose gradually at 3-day intervals, up to 0.1 or even 0.5 Gm., testing the results with intradermal injection of always 1/10 milligram every 2 weeks. The progressive diminution of the reaction to this Mantoux intradermal test, while the therapeutic dose is being constantly increased, shows that immunization is effected. If the Mantoux reaction grows more pronounced, the tuberculin should be suspended.

To determine the exact dose of **tuberculin** for a child with pulmonary

tuberculosis, Myer Solis-Cohen (Trans. Am. Med. Assoc.; N. Y. Med. Jour., June 16, 1917) injects intracutaneously in 1 forearm, distally, medially, and proximally, respectively, 0.0000001, 0.000001, and 0.00001 milligram. If no reaction occurs, he later injects in the other forearm 0.0001, 0.001, and 0.01 milligram, and so on, up to 10 milligrams. The smallest amount producing a reaction is then given therapeutically *per os* or hypodermically. One patient reacted to 0.0000001 milligram, another to 10 milligrams, a dose a hundred million times larger.
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Diagnosis, viii. 644.—The "crossed-hip reflex," a new sign, is described by E. B. Gunson (Lancet, Sept. 16, 1916) as follows: When the quadriceps femoris muscle mass is firmly grasped just above the knee between the thumb and fingers the patient experiences considerable pain, and there occur flexion at the hip-joint and extension of the great toe of the opposite limb. The reflex may be incomplete and consist of flexion at the hip only, or of flexion at the hip and contraction of the tensor fasciæ femoris muscle without actual extension of the great toe; crossed extension of the great toe without flexion at the hip occurs in some cases.

Prognosis, viii. 651.—In 892 cases of typhoid or paratyphoid reported by P. Guizzetti (Riforma Medica, Mar. 31, 1917), the mortality averaged 4.25 per cent., but it was only 3.33 per cent. in the vaccinated. The death was due to peritonitis from perforation in 44 per cent. of the fatal cases in the vaccinated, and in only 12.5 per cent. of the non-vaccinated. The perforation was always in the ileum, usually the lower third, and seemed to be due to the fact that the mildness of the symptoms in the vaccinated led them to be less prudent.

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Alvarez (Siglo médico, Jan. 6, 1917) recalls Loir's observation to the effect that 20 Gm. (5 drams) of **vinegar** in a liter (quart) of contaminated water kills bacteria in it, including those of the typhoid group. The same occurs upon 50 per cent. mixture with an **acid wine**. After 40 years' experience he recommends giving typhoid and paratyphoid patients an abundance of **acid drinks**, *e.g.*, vinegar water or hydrochloric acid lemonade.

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Warren Coleman (Trans. Amer. Med. Assoc.; N. Y. Med. Jour., June 16, 1917) in a statistical study of some 450 cases of typhoid fever, half on milk and half on a **high calory diet**, *i.e.*, liberally, found no evidence that the duration of fever or range of temperature was affected by diet. The total duration of the disease, however, was shortened through the shortening of convalescence. Tympanites occurred in 17 per cent. of the high calory cases and in 31 per cent. of those on milk. Diarrhea occurred in 16 per cent. high calory cases and in 49 per cent. of those on milk. Temporary diarrheas were more frequent in the high calory cases.

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Widal and Salimbeni (Presse méd., Jan. 4, 1917) employ a simple emulsion of typhoid and paratyphoid A and B bacilli killed by heat in 9:1000 saline. It contains 10 billion germs to each 3 c.c. This is injected, first 1 c.c. and then 2 c.c. after a 7-day interval. Nearly 5000 persons thus vaccinated showed no more reaction than with the weaker vaccines, while the antibodies in the blood were later found as abundant as in those given the usual 4 doses.

N. Fiessinger (Med. Press, Jan. 17, 1917) deems it wise to assume that antityphoid vaccination aggravates chronic affections of the kidneys (tuberculosis, albuminuria, etc.) and of the liver (chronic jaundice, cirrhosis, etc.). In general it should only be performed on men who are at rest and not liable to sudden alarms. Subjects above 40 years of age, to be vaccinated, must be robust, and not have an unduly high blood-pressure. Among those below 40, the over-wrought, tired, and emaciated should be kept under observation for a time before being vaccinated.

The pathological contraindications include all acute or chronic infections, such as sore throat, bronchitis, etc. Malaria and syphilis are not contraindications. A history of cervical adenopathy or bone tuberculosis is not an absolute contraindication, but if there be even suspicion of dullness at the apex, with exaggeration of fremitus and rough breath sounds, one must abstain. Fibrous phthisis, even if cured, is also a bar.

Kilgore (Arch. of Internal Med., Feb., 1917) found, in accord with others, that the cutaneous typhoidin test should not be relied on as an index of immunity in individual cases.

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Nichols (Jour. Exper. Med., xxiv, 497, 1916) asserts that alkaline therapy deserves a trial for the prevention and cure of typhoid carriers.

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Etiology, viii. 667.—The endemic typhus fever in Serbia, Bulgaria, Russia, Mexico, and New York (Brill's disease) is due, according to Plotz (Trans. N. Y. Acad. of Med.; N. Y. Med. Jour., Mar. 24, 1917), to a new organism regularly to be found and cultivated. It occurs in greater numbers early in the disease and during chills, and is pathogenic for guinea-pigs in early subculture. Specific agglutinins, precipitins, opsonins, and complement-fixing antibodies are regularly present in the blood, mainly after the crisis. The same organism was cultivated from infected lice. Prophylactic vaccination was carried out in Serbia, Bulgaria, Russia, and Mexico during the winter of 1915-1916, chiefly among doctors, nurses, and orderlies. Of 8420 persons vaccinated, only 6 developed the disease during the 4 months of an epidemic.

N. E. Brill (Trans. N. Y. Acad. of Med.; N. Y. Med. Jour., Mar. 24, 1917) believes that there is not the slightest doubt that the *Bacillus typhi exanthematici* discovered by Plotz is the cause of typhus.

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- Tyrosinuria.

  Tyrosin crystallizes in very fine needles, arranged in sheaf-like aggregations. In masses the crystals are snow-white, odorless, and tasteless. Crystallized from an alkaline solution tyrosin often takes the form of rosettes. Tyrosin is insoluble in alcohol and ether, feebly soluble in cold water, but readily soluble in acids, alkalies, and hot water.

  Hoffmann's Test.—Solutions of tyrosin, when heated with *Millon's reagent* (mercury, 10 grams dissolved in 20 c.c. of nitric acid, to be diluted with equal volumes of water), yield a brilliant crimson or pink coloration.

  Piria's Test.—The tyrosin is moistened with sulphuric acid and warmed for 5 or 10 minutes on a water-bath. It turns pink as tyrosin-sulphonic acid. Dilute with water, warm, neutralize with barium carbonate, and filter while hot. Careful addition of very dilute iron perchloride solution causes a violet coloration readily destroyed by excess of the iron solution.

  Kuhn's Test.—Tyrosin when heated emits the odors of phenol and nitrobenzol.

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    John Homans (Surg., Gynec. and Obstet., Mar., 1917) notes that whereas ulcers arising from the ordinary surface varix are generally healed by adequate removal of varicose veins, those due to post-phlebitic varix, rapid in development, are generally incurable by removal of varicose veins alone, and must be excised. Chronic ulcers originating in trauma and infection should, if well defined, be excised and grafted.

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    Rémond and Minvielle (Bull. de l'Acad de méd., Paris, Mar. 6, 1917) conclude from an experimental research that the thyroid has unquestionably some influence on the clinical picture of uremia, either by neutralization of toxins, or by stimulating the functioning of the suprarenals. It has a toxin-destroying function, and the clinical picture of uremia is aggravated by its removal.

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H. G. Bugbee (Trans. Amer. Assoc.; N. Y. Med. Jour., June 23, 1917), reviewing 198 cases of ureteral lithiasis, states that symptoms of stone were often absent. Pain is the most constant symptom, and X-ray findings are positive in 98 per cent., whereas the urine examination is unsatisfactory. The catheters used should be boiled a long time to make them flexible, and the wax tip should be used. One negative test is often misleading. Stones of moderate size can often be removed by twisting the ureteral catheter around them and withdrawing them.

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Werelius (Trans. Amer. Med. Assoc.; N. Y. Med. Jour., June 30, 1917) emphasizes the high mortality of transplantation of the ureters into the intestine, owing to infection. Experimentally he has found that if the ureters are anastomosed instead into the fallopian tubes or the uterus, this drawback is almost entirely obviated.

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H. D. Furniss (Trans. N. Y. Acad. of Med.; N. Y. Med. Jour., May 12, 1917) states that ureteral obstruction as seen by him, has been almost exclusively in women with histories of long-standing trouble. A diagnosis of stone has usually been made, but no stone found with the X-rays. With pyelography, it is possible to make a graphic diagnosis in all these cases. This should be attempted only in hospitals, where possible complications may be promptly attended to.

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Urine, casts in.

Tube casts are believed to consist of a coagulable substance closely allied to proteids which enters the renal tubules through lesions of their walls. Any free or partly detached products of the tubules become adherent to the basis substance. A cast consisting solely of the latter is called a *hyaline cast.* Addition of epithelium or blood-corpuscles forms *epithelial* or *blood-casts*. Addition of disintegrated tissue matter forms *granular casts*. Similarly, *fatty*, *bacterial*, and *pus-casts* may be formed. One form of hyaline cast, usually large, occasionally gives an amyloid reaction with methyl-violet and Lugol's solutions. The edges may be indented, but their surface is smooth. This is the so-called *waxy cast*, found in all forms of nephritis, irrespective of amyloid renal disease. The amyloid reaction probably indicates a degenerative change in the cast itself.

Long, wavy structures, often dividing and subdividing at their ends, are the so-called *cylindroids* of Thomas. They are not characteristic of renal disease, but rather of an irritation of the lower urinary tract which has extended up to the kidneys.

Detection.—Casts are collected for examination by allowing the urine to stand for 24 hours, or better, by use of the centrifuge for 2 or 3 minutes. A portion of the sediment placed on a slide is examined with the ¼-inch objective in a clear, but not too strong light. Casts may be stained, as recommended by H. B. Erdman, by treating for 3 minutes with 5 per cent. mercuric chloride solution, washing in water, and applying for 5 minutes a fresh mixture of 0.3 per cent. methylene blue and 0.02 per cent. fuchsin aqueous solutions. The preparation is then washed, and may be dried and mounted in balsam. According to Heitzmann, actual identification of cast-like structures as tube-casts is justified only in the presence of other evidences of a pathologic condition, such as red corpuscles, leucocytes, or pus-corpuscles and epithelia from the uriniferous tubules.

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Urobilinuria.

Urobilin is regarded as a normal constituent of the urine, being its principal coloring matter. When present in excess, it imparts a red-brown color. Urobilinuria occurs in fevers, in hepatic diseases, after hemorrhagic effusions (due to resorption); in the hemorrhagic diathesis; in purpura; and in progressive pernicious anemia and in chlorosis. It is said to indicate with certainty that the liver is the cause of the disturbance. For its detection *spectroscopic examination* will reveal a marked absorption-band between Fraunhofer's lines *f* and *b*, fading off from the green into the blue.

Schlesinger's test has already been given (vi. 496); also Ehrlich's benzaldehyde test, and others (iii. 306; vi. 380). *Edelmann's test* makes use of two reagents, viz., a 10 per cent. alcoholic solution of mercuric chloride, and a 10 per cent. solution of zinc chloride in amylic alcohol. The reaction, when positive, is a red-green fluorescence.

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Frank (Jour. Cancer Research, Jan., 1917) regards radium the best palliative in inoperable cancer of the cervix, even in far advanced cases. The minimum quantity needed is 50 mg. Borderline or operable cases should be operated after a short course of radiation, while operated cases should have postoperative prophylactic radiation.

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Leonard and Dayton (Surg., Gynec. and Obstet., Feb., 1917) are convinced from a short experience with Percy's method that fatalities must have been frequent wherever this method has been used extensively. They report 2 fatal cases, the result of septicemia.

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In epidemic vaginitis in children, irrigating the infected parts once a day with 2 quarts (liters) of normal saline solution, followed by injection of 2 or 3 ounces (60 or 90 c.c.) of a 1 per cent. solution of silver nitrate, is, according to B. K. Rachford (Amer. Jour. Med. Sci., Feb., 1917), the best local treatment.

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Vagotonia and sympatheticotonia.

The vegetative nervous system, which includes all nerve fibers supplied to organs having smooth muscles, the intestines, blood-vessels, gland ducts and glands; also to the heart, to terminals of the alimentary canal, and the muscles of the genital apparatus. It differs from the sensori-motor nervous system, mainly, in having ganglion cells. It is divided into a *sympathetic* system proper, and into an *autonomic* system. In the latter the nerve fibers arise from the mid-brain, the medulla, and the sacral cord, and do not come into relation with the sympathetic cord. The sympathetic and autonomic systems are antagonistic functionally, yet both furnish fibers to each organ. The most important nerve of the autonomic system is, of course, the vagus. Fibers of the vagus go to the heart, stomach, bronchi, esophagus, intestine, and pancreas; while nerves from the sacral portion supply the bladder, anus, genital apparatus, descending colon, and sigmoid. Whether a common nerve center controls both systems is not known. They may be influenced, however, independently, by drugs and physiological stimulation, and it is mainly through investigations based on this fact that the two systems have been identified as separate entities.

Vagotonia is thought by Eppinger and Hess to denote a morbid hyperexcitability of the autonomic or "extended vagus" side of the vegetative system. Marked variations were found to occur in the response of individuals to the drugs acting on the latter. In some the ordinary dose of atropine gave practically no response, while in others a small dose produced tachycardia, dry mouth, fever, mydriasis, etc. Such being the case, the diagnosis of vagotonia can always be established by a study of the action of the various drugs, which tend to stimulate or paralyze either the sympathetic or autonomic system.

Symptoms.—The symptoms of vagotonia are numerous and varied—accommodation spasm, widening of the palpebral fissure, mild convergence spasm, and epiphora. Salivation is exaggerated, and sweating, especially of the hands and feet, is common. The latter extremities often become cyanotic in cold weather, and can be readily blanched by pressure. Dermatographia of the vasodilator type, and some forms of pigmentation are noted in increased vagus irritability, and are attributed to the autonomic innervation of the vasodilators or inhibition of the vasoconstrictors. Various cardiac neuroses, bradycardia, irregularity, etc., and some precordial pains (pseudoangina) are also mentioned. Aschner's phenomenon, a bradycardia caused by pressure upon the eyeball, likewise occurs in vagotonia. Asthma may also exemplify periodic vagus irritation; also the accompanying eosinophilia, a fact suggesting that the production of eosinophiles is, at least in part, controlled by the autonomic sytem. Anaphylaxis seems to occur especially in vagotonic subjects. This applies also to various gastric neuroses, including eructations, hyperacidity, sensations of fullness, pressure, acute distension, pylorospasm, vomiting, "globus hystericus" etc. The intestinal symptoms are spastic constipation, periodic diarrhea, mucous colitis, and rectal tenesmus. Neurotic genital symptoms, such as priapism, ejaculation precox, prostatorrhea, functional dysurea, etc., are attributed to irritability of the sacral autonomic system. Vague disorders, such as neurasthenia, nervousness, hysteria, etc., have been regarded by Eppinger and Hess, as due to vagotonia.

Pathology.—The internal secretions are believed to be at fault. Vagotonia is apt to be observed in the young and constitutionally inferior, and is thought to bear a relationship to status lymphaticus and the so-called lymphatic constitution.

Treatment.—Atropine has been found to modify advantageously the spastic states of vagotonia, but according to Sublinski (Berl. klin. Woch., May 17, 1915) this agent must be given perseveringly in ascending and descending doses. **Arsenical waters** were also found useful. Spitzig (Wiener. klin. Woch., July 9; 1914) likewise found **atropine** very helpful in dysmenorrhea of vagotonic origin. In some it produces flushing, tachycardia and cerebral excitement, as in a child observed by Boehm (Boston Med. and Surg. Jour., Mar. 30, 1916), but **adrenalin** proved helpful, temporarily.

[Vagotonia rests on theoretical grounds. Prudence is imperative. C. E. de M. S.]

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These comprise the injuries inflicted by insects or arachnids, snake bites and rat-bite fever.

Stings by Insects and Arachnids.—As a rule, the lesions produced are purely local, exciting no constitutional manifestations. This applies, *e.g.*, to the bite of the common Culex *mosquito*. Over such bites **menthol** in crystalline form or as menthol-camphor may be applied, often with considerable relief. **Ammonia water**, useful to neutralize the strongly acid poison introduced by most insects in stinging, will often reduce suffering in mosquito bites if promptly brought and kept in contact locally for a few moments. Similar measures are applicable in *sand fly* **bites** and those of the *diablito colorado* ("little red devil") of the tropics. For *bee, wasp,* or *hornet* stings, 5 per cent. **potassium permanganate** solution has been advised.

Spirit of ammonia is a favorite application. In bee stings the barbed sting left in the tissues, may sometimes with advantage be removed by means of fine forceps and a magnifying lens. According to G. King, powdered **ipecacuanha**, made into a paste, will largely prevent local swelling and pain in bee stings. Ottinger, in all venomous insect bites, recommends **ichthyol**, pure or mixed with **wool fat**; if the part is already swollen, **rubber sheeting** and **ice** are applied over the ichthyol.

In *jigger bites,* radical treatment consists in removing with a fine needle the skin from the little ball or nest produced by the insect, pressing the ball out between the fingers, and filling the cavity with some antiseptic to kill any remaining eggs. Mexican guides destroy the embedded insect by applying a lighted cigarette to the spot.

In the case of *wood ticks* the head of the insect should be extracted from the tissues with a needle or knife; or, **turpentine** or any essential oil applied to the insect posteriorly may cause it to loosen its hold. A drop of **chloroform** may be injected locally for the same purpose.

Stings of *scorpions* and *poisonous spiders* and *centipedes* are relieved by the local use of a weak solution of **phenol. Camphor, potassium permanganate, rum,** or **lemon juice** may also prove serviceable. Where constitutional depression is noted after bites by these or other venomous invertebrates, **rest** and **stimulants,** especially **strong coffee,** are indicated. In severe spider bites local injection of 5 per cent. **permanganate** may prove advantageous.

In insect bites complicated by bacterial infection, *e.g.,* in many bites by horse flies or deer flies, the usual principles of treatment for local infection are applicable, viz., **tincture of iodine, moist antiseptic dressings,** and **incision** when opportune.

Prophylaxis of insect bites for travellers, soldiers, and others exposed, comprises the use of a strong **carbolic soap** for washing, moistening exposed parts with a solution of 1 ounce of **phenol** in a bucketful of water (without wiping), or the external use of an **emulsion of kerosene** or **petroleum. Oil of citronella** and **camphor in alcohol** are of some value as mosquito preventives.

Snake Bites.—Of the 25 or more species of venomous snakes of the United States the commonest are the rattlesnake, copperhead, and moccasin. The venomous snakes, as a class, are characterized by a triangular head, relative plumpness of body, apparently rough surface, elliptical pupils, and a pit or depression between each eye and the corresponding nostril. After all bites by poisonous snakes, including the various tropical forms, the symptoms comprise a gradually increasing pain, infiltration and ecchymoses of the surrounding tissues, and general effects, such as central respiratory depression, impaired heart action, drowsiness, cold sweats, vomiting, and prostration. Death from cardiac paralysis may ensue in a few hours or, after a day or two, the poisonous action on the blood and other tissues may result in mental disturbances or exhaustion and coma. As a rule, however, the prognosis is unfavorable only in previously enfeebled subjects or children.

In the treatment the first step should be to **tie a cord** or **handkerchief** tightly **about the bitten limb,** above the wound. **Suction** of the wound may then be practised—in the absence of syphilitic infection—providing the lips be not cracked nor the oral mucosa abraded. The **part bitten should** then **be excised,** using a penknife if necessary, and the part allowed to bleed freely. Where the skin can be pinched up it may be cut off with scissors, deeper tissues being subsequently removed if necessary. **Cauterization** with a hot iron is less reliable than excision. Chemical destruction of the poison is a possibility, a 1 to 5 solution of **potassium permanganate** or strong **ammonia** being injected into the wound with a hypodermic syringe. According to White, the best chemical antidote is a 2 per cent. solution of **hypochlorite of lime.** F. Howard administers internally 1 tablespoonful of **potassium nitrate** in a glass of water (1 teaspoonful in a child under 10 years). Symptomatic general treatment consists in antagonizing the depressing actions of the venom by means of **ammonia preparations, whisky** or **brandy, digitalis, strychnine,** etc., hypodermically or by mouth.

Various **antitoxins** for snake bites, *e.g.,* **Calmette's serum,** have been prepared and successfully used. Pinto states that in Brazil, in which he estimates an average of 4800 deaths yearly from cobra bites, the serum prepared in France from the venom of serpents in British India has not proven effectual against the Brazilian snake bites. At the Sao Paolo Institute, however, an antitoxin is being produced against each of the four groups of native snakes; from 10 to 20 c.c. are injected, at once, and the dose repeated if necessary, in 6 hours. Writing from India, Acton and Knowles express the view many fatal cases could be saved by **immediate firm ligature,** hypodermic impregnation of the whole area with a strong solution of **gold chloride,** and intravenous injection of 100 to 200 c.c. of **antivenene,** if the biting snake is suspected to have been a cobra or Russell's viper; if venom symptoms appear, even larger injections of antivenene should be given. With serums concentrated 10 times, 20 to 60 c.c. should save every cobra case.

Rat-bite Fever.—This is an infection following the bite of a rat or, much less frequently, a cat, weasel, or ferret. In Japan, where it has been commonest the disease is termed *Sokodu.* Cases have also been met with in America—including the United States—Europe, and other countries of Asia. The causative agent has been supposed to be the *Streptothrix muris-ratti* of Schottmüller (Dermatol. Woch., 77, lviii, 1914), likewise found clinically by F. G. Blake (Jour. of Exper. Med., 39, xxiii, 1916), but according to Japanese investigators—Futaki, Takaki, Taniguchi, and Osumi (Jour. of Exper. Med., 33, xxv, 1917)—it is a protozoön, *Spirochæta morsus-muris.*

Symptoms.—The incubation period ranges from 1 to 60 days, averaging 2 weeks. According to Wilder Tileston (Jour. Amer. Med. Assoc., Apr. 1, 1916), this is followed by 1 or more febrile attacks, with a characteristic rash, the paroxysms tending to recur regularly every 5 to 10 days, and last 2 to 3 days. The temperature rises gradually to the second day, then falls by crisis, with profuse sweating. Severe muscular pains and dysphagia are often prominent. In the intervals the patient feels almost well. In occasional cases there is only 1 attack, the fever lasting for several weeks, and being remittent or intermittent. Abortive and febrile forms occur. The mortality is 10 per cent.

Prophylaxis and Treatment.—The former consists in **immediate cauterization** of the wound with strong **phenol** or the **actual cautery.** In the curative treatment, **salvarsan** is followed by immediate cessation of the paroxysms. K. Nakasone (Sei-I-Kwai Med. Jour., Jan. 10, 1916), among others, has reported 2 cases thus promptly cured.

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Symptoms.—Further observation of this disease has led to the realization that it is relatively common. J. J. Richardson (Annals of Otol., Rhinol. and Laryngol., June, 1914) notes that while the usual point of attack is the tonsil, the disease may involve the uvula, soft palate, tongue, gums, cheeks and lips, sublingual glands, larynx, and trachea, the last especially in children. Ramond (Prog. méd., Mar. 5, 1916) finds the lesions usually much more marked on one side, with the gland below the jaw involved early. The ulceration takes 2 to 4 weeks to heal and leaves a deep cavity. He has seen 5 cases of associated Vincent's angina and diphtheria.

F. E. Taylor and W. H. McKinstry (Brit. Med. Jour., Mar. 31, 1917) have noted the frequent occurrence of cases in which the infection was limited to the gums close to the necks of the teeth, and have come to regard this as a clinical entity.

Etiology.—Reiche (Münch. med. Woch., Feb. 16, 1915) finds the disease most frequent in July, August, and September. According to Richardson (*loc. cit.*), it is commonest in young male adults or adolescents, and is predisposed to by oral uncleanliness or disease, bad condition of the teeth, and unsanitary work and surroundings. It frequently follows measles, scarlet fever, pertussis, and diphtheria.

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Galyl, a French organic arsenical, applied in admixture with glycerin or oil, or in powder form, is successfully used by Achard and E. Welter (Bull. de l'Acad. de méd., Sept. 7, 1915) as a substitute for old and neosalvarsan in Vincent's angina and other local infections with fusiform bacilli and spirilla, such as noma, mercurial stomatitis, various dental affections, scorbutic mouth ulcerations, erosive balanoposthitis, and certain gangrenous wounds and rebellious ulcers.

Löffler's solution in, vii. 429
methylene blue in, vi. 687
neosalvarsan in, vii. 429

A 10 per cent. solution of **neosalvarsan** in glycerin has proven very effective in the hands of Renaux (Thèse de Paris, 1914), following Zilz, Netter, and Achard. It is applied to the ulcers three times a day.

salvarsan in, iv. 229
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Sodium perborate is recommended by H. H. Stark (Annals of Otol., Rhinol. and Laryngol., Mar., 1915), who states that it eases pain and cures promptly.

According to J. J. Richardson (Annals of Otol., Rhinol. and Laryngol., June, 1914), **trichloracetic acid in full strength** may be used with much success. Where ulceration is extensive iodine is preferable. In the tonsillar form drainage from the affected crypt should be promoted.

A 5 per cent. solution of **trikresol** in alcohol, applied frequently to the ulcer, is believed superior to other remedies by Wingrave (Jour. of Laryngol., Rhinol. and Otol., Dec., 1915). Diluted with water to 0.5 per cent., it may be used as mouth wash. Next to trikresol comes **formalin**, best used as **lysoform**, pure or diluted. For astringent purposes, **zinc permanganate**, 1 grain (0.06 Gm.) to 1 ounce (30 c.c.) of water, is recommended.

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  - elevate foot of bed in, v. 778, 779, 781
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Vitamines.

The outer coatings of grain and the quality of freshness in fresh vegetables have been shown to be of great importance in bodily nutrition. To the substances in the pericarp of rice counteracting beriberi, Casimir Funk, of London, in 1912 applied the name vitamines. Similar substances have been shown to exist in the pericarps of wheat, corn, rye, oat and barley grains. Though vitamines are present in only minute amounts, not a single animal fed on vitamine-free food, however varied and plentiful, was found able by Funk to live more than a short time. A given amount of vitamine will take care in the body of only a certain amount of carbohydrate food. In the experimental polyneuritis in fowls, even starvation proves much less quickly harmful than a diet only of polished rice. The more polished rice taken, the greater the certainty and severity of beriberi, according to Levene (N. Y. Med. Jour., June 10, 1916). In the absence of vitamines, according to Funk, metabolism goes wrong, as shown in a negative balance of nitrogen and of inorganic constituents, such as calcium, phosphorus, and sulphur.

In Seidell's experiments (U. S. Public Health Rep., No. 325, Feb. 18, 1916), pigeons with severe paralysis due to a polished rice diet plainly showed improvement within an hour after an injection of vitamine, and seemed entirely normal the next morning. Vitamines, as shown by Shie (Cleveland Med. Jour., Apr., 1916), have a striking influence on the growth of young animals, which may be completely stopped by vitamine deficiency.

Marked changes in the chemical composition of the brain were found by Funk in animals fed on shelled rice. The thymus gland, normally large and persistent in pigeons, atrophies completely under a polished rice diet. Changes in the pituitary and decided atrophy of the testes or ovaries also occur.

Diseases other than beriberi now attributed by many to insufficient vitamine intake include scurvy, Barlow's disease, pellagra, rickets, and osteomalacia. Infection is probably also favored, the experimental animals suffering from an eye infection which promptly disappears upon addition of vitamine.

Less pronounced vitamine insufficiency in infants may cause restlessness, irritability, and greenish stools containing either mucus or curds, according to Fischer (N. Y. Med. Jour., June 16, 1917). Loss of appetite is an early symptom of vitamine deficiency, and is thought especially significant in children, chlorotics, and convalescents. Vomiting, diarrhea, and meteorism are other results.

Lately, Ramoino (Policlinico, May 6, 1917) has reported gastrointestinal disturbances, herpes, eczema, epistaxis, bluish gums, malodorous breath, pains in the joints, muscles, and head, loss of weight, mental dullness, and melancholia were conditions widely noticed among Italian troops as a result of deficient vitamines in the rations; when food rich in vitamines could be obtained all these symptoms generally subsided.

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Rutherford Morison (Brit. Jour. of Surg., Apr., 1917) treats infected war wounds as follows: Under an anesthetic, usually open ether, cover the wound with gauze wrung out of 1:20 **phenol**, and clean the skin and surrounding area with the same lotion. Open the wound freely, sparing nerve trunks and muscular branches of nerves. Cleanse the cavity with dry sterile mops, Volkmann's spoon, etc., and remove all foreign bodies. Mop the skin and cavity with **methylated spirit.** Rub **bismuth iodoform ("Bipp") paste** well into all parts of the wound with dry gauze, removing any gross excess: **Iodoform**, 16 ounces (480 Gm.); **bismuth subnitrate**, 8 ounces (240 Gm.); **liquid paraffin**, 8 fluidounces (240 c.c.), or a sufficient quantity to form a paste. Rub down the paste, in small quantities at a time, on a slab with a spatula, to insure freedom from grit, etc. Dress with sterile gauze, and cover with an absorbent pad. This dressing requires no change for days or weeks if the patient is free from pain and constitutional disturbance. Should discharge come through, the stained part must be soaked in **alcohol**, and a gauze dressing wrung out of the same applied as a further covering. In redressing the wound is covered with cotton soaked in alcohol, and the discharge wiped off the surrounding skin. The paste in the depths is clean and is not disturbed.

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betanaphthol di-iodide in, vi. 786
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Brilliant green was found by R. W. Hodgson-Jones (Brit. Med. Jour., Apr. 7, 1917) an efficient stimulant to the growth of epithelium in superficial wounds, as well as a non-irritating antiseptic. He uses an ointment of 1 part of brilliant green in 2 of alcohol, incorporated in 100 parts of soft petrolatum. All crusts and scabs are removed and the ointment applied upon gauze cut to conform to the denuded surface.

camphor spirit in, ii. 733

W. Sherman (Trans. Amer. Med. Assoc.; N. Y. Med. Jour., June 16, 1917) notes that in **Carrel's method** the wound is first thoroughly cleansed with a soap solution and then treated by allowing **Dakin's solution** to come in contact with every part of it by instillation every 2 hours. The wounds are dressed aseptically and very carefully every 24 hours, the surrounding skin being protected with yellow vaseline. Granulation tissue forms rapidly and is firm and healthy, with very little bleeding. There is no pain and the wounds heal with great rapidity and without much scar tissue.

Daufresne's technique of preparing the **Dakin solution** has been described by Dakin as follows (Keen: "Treatment of War Wounds," 1917): "Two hundred Gm. (6⅔ ounces) of good bleaching powder are put in 12-liter (quart) bottles with 5 liters (quarts) of tap-water. The solution is shaken vigorously and allowed to stand for at least 6 hours. In another vessel 100 Gm. (3⅓ ounces) of dry sodium carbonate and 80 Gm. (2⅔ ounces) of sodium bicarbonate are dissolved in 5 liters (quarts) of cold water and then added to the bleaching powder mixture. The whole is shaken vigorously for a few minutes, and the precipitate allowed to settle. After half an hour the clear solution is siphoned out and filtered through paper. With the most brands of American bleaching powder it is better to use 90 Gm. (3 ounces) of each salt. The solution must invariably be tested for neutrality by adding a pinch of solid phenolphthalein to a little of the solution. If the solution should react alkaline, 1 of 3 methods must be employed to correct it, otherwise skin irritation will surely result: (*a*) Pass carbon dioxide gas into the solution until a sample shows no alkalinity. (*b*) Reduce the proportion of sodium carbonate and increase the bicarbonate. (*c*) Add boric acid. The carbonate-bicarbonate mixture possesses greater stability and can be kept for several weeks without much deterioration."

F. Rosengarten (Jour. Amer. Med. Assoc., Sept. 29, 1917) describes a rapid method of preparing **Carrel-Dakin solution.** The materials: A solution of chlorinated soda containing 2.8 to 2.9 per cent. of available chlorine; one of sodium bicarbonate of about 5 per cent. strength; and some phenolphthalein powder. One part of chlorinated soda solution is diluted with 5 of water, and to this 25 c.c. (6¼ drams) of the bicarbonate solution is added for each liter (quart). The whole is well mixed and 20 c.c. (5 drams) removed and tested with a little phenolphthalein. If there is no red color the solution is ready for use. If red appears, 10 to 20 c.c. (2½ to 5 drams) more of bicarbonate solution is added, and the test repeated until the red does not appear. The chlorinated soda solution is readily obtainable, and keeps well.

W. O'N. Sherman (Penna. Med. Jour. June, 1917) notes that **Dakin's solution** should never be used in the eye, nor intravenously because of its hemolytic action; it should be kept in a cool, dark place. Infection can be aborted if the treatment is begun within 24 hours. If suppuration is established, it can be controlled if the focus is reached.

Describing **Carrel's method,** G. Loewy (N. Y. Med. Jour., Oct. 27, 1917) notes that tubes have been found most practical to carry the liquid to the wound. They are lengths of rubber tubing of 4 millimeters interior diameter, 30 to 40 millimeters in length. They are closed at one end by tying with strong linen thread, and perforated from the same end over a length of 5, 10, 15 and 20 centimeters by means of a punch, making holes ½ millimeter in diameter, perforating both walls 1 centimeter apart. The tubes are so arranged in the wound that the liquid may readily spread over the whole surface. They are not applied over gauze, but directly to the wound, and compresses soaked in Dakin's solution are laid over them. Gravity plays a considerable part in distribution of the liquid. Covered tubes with Turkish toweling are used in cases of superficial wounds, vertical setons and wounds of the posterior aspect of the limbs. In superficial wounds instillations may be made through a looped perforated tube attached to the skin above by adhesive plaster. On inclined surfaces the tubes should be applied to the upper portion of the wound. All tubes are connected by glass distributing tubes with the irrigating flask. The latter usually holds a liter and its inferior orifice has a diameter of 7 millimeters. It is hung at a height of from 60 to 100 centimeters above the bed, acording to the number of tubes in the wound.

Every 2 hours the nurse releases the pinch cock for a few seconds and gives to the wound from 30 to 100 c.c. (1 to 3⅓ ounces) of solution. The total quantity per diem varies from 250 to 1200 c.c. (8⅓ to 40 ounces). At the daily dressings the skin is protected by squares of gauze soaked in yellow vaseline. A pad of absorbent and non-absorbent cotton covers the entire dressing, the absorbent layer being placed next to the wound.

Smears are taken every 2 days from the most infected parts of the wound the instillation being stopped 2 hours before. They are stained by carbolthionin and the bacteria counted. With a Bausch and Lomb microscope the No. 10 ocular and 1.9 millimeter objective are used. The average number of bacteria in a field is then estimated and charted. When only 1 bacterium is found in 5 to 10 fields surgical asepsis is obtained and the wound can be sutured with safety. Wounds of the soft parts, with sterilization begun in a few hours, can thus be closed after 2 days. In fractures it is preferable to wait until the wound has been surgically sterile for 4 or 5 days. Where sterilization has been begun after a period of suppuration, one should find the secretions sterile for a week at least before suturing.

Grimberg (Paris méd., Mar. 31, 1917) introduces **Dakin's solution** into the wound in a continuous flow and **aspirates** it below by the following device: A jar with the tube entering the stopper, and a tube and faucet below. As the fluid in the jar flows off through the lower tube, the vacuum left aspirates the fluid in the wound. The ends of the tubes in the wound are wrapped with cotton and gauze, tied in place, and the aspiration continued automatically for hours at a time.

Keen ("Treatment of War Wounds," 1917) mentions 3 important objections to the **Carrel-Dakin method:** (1) Irritation of the skin, sometimes very painful, and which may persist for a long time. Not only must the **skin** be **protected by vaselin,** but minute care must be taken to insure the exact strength of the solution.

Below 0.45 per cent. the germicidal action is too feeble. Above 0.50 per cent. the solution is too irritating. The solution must, therefore, be most carefully made and tested, and fresh solutions constantly prepared. (2) The solutions, in contact with the wound exudates, lose their chlorin in an hour or even less. Hence the need of a new supply every 2 hours, rendering the method time-consuming and costly. (3) For the maximum germicidal effect the solutions must be kept in constant contact with all surfaces of the wound. In the Dakin-Carrel technique this is done by making basin-like cavities of all wounds, which means that dependent drainage must be avoided.

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creosote water in, iii. 689
diaphtherin in, vii. 446

Chlorine reacts with wound fluids to form chloramines, according to H. D. Dakin (Jour. Amer. Med. Assoc., July 7, 1917), and these substances, while highly bactericidal, are not irritating. They can be prepared synthetically, and experiments have led to selection of the compound tolueneparasulphondichloramine, or **dichloramine-T.** This can be used in strengths varying from 5 to 10 per cent., dissolved **in chlorinated eucalyptol and liquid petrolatum.** In this form it is stable if kept in a colored bottle, and retains its germicidal power for 18 to 24 hours in infected wounds. It is several times more efficient than the hypochlorites. An infected wound should first be cleansed, and all dead tissues and foci of infection removed. The dichloramine-T solution should then be applied by either spraying or filling the wound cavity with it. A very thin dressing should be used, and the application repeated at intervals of 18 to 24 hours. This reduces the average healing time by 16 per cent. below that for the hypochlorites, which was, itself, only ⅓ the average time with other methods. The chlorine dissolves dead tissues, so that special care must be taken to ligate all vessels, lest secondary hemorrhage follow. Keen (*ibid.*) whose recent work should be read by every surgeon, describes the preparation of **dichloramine-T** by the *Chattaway method.* Chlorinated lime (from 350 to 400 Gm. —11⅔ to 13⅓ ounces) of good quality is shaken with 2 liters (quarts) of water on a shaker for half an hour, and the mixture allowed to settle. The supernatant fluid is siphoned off and the remainder filtered. Powdered tolueneparasulphonamid, 75 Gm. (2½ ounces) (the crude product may be used), is then added to the whole of the hypochlorite solution and shaken until dissolved. The mixture is filtered, if necessary, placed in a large separating funnel and acidified by gradual addition of acetic acid (100 c.c.—3⅓ ounces). Chloroform (about 100 c.c.—3⅓ ounces) is then added to extract the dichloramine, and the whole well shaken. The chloroform layer is tapped off, dried over calcium chloride, filtered, and allowed to evaporate in the air. The residue is powdered and dried in vacuo. The product sold as "chlorazene" may be substituted for the toluene-parasulphonamid.

In the preparation of **chlorinated eucalyptol,** 500 c.c. (1 pint) of eucalyptol (U. S. P.) are treated with 15 Gm. (½ ounce) of potassium chlorate and 50 c.c. (1⅔ ounces) of concentrated hydrochloric acid. After 12 hours the oil is well washed with water and sodium carbonate solution. Dry sodium carbonate is added to the oil, and the mixture allowed to stand 24 hours. It is then filtered and dried with a little calcium chloride.

To prepare **chlorinated paraffin oil** 500 c.c. (1 pint) of commercial liquid petrolatum are treated with 15 Gm. (½ ounce) of potassium chlorate and 50 c.c. (1⅔ ounces) of concentrated hydrochloric acid. The mixture is exposed to the light and allowed to stand over night. It is then put into a separatory funnel and washed successively with water, sodium chloride solution, and water. The opalescent oil is tapped off, a lump or 2 of calcium chloride and 5 Gm. (1¼ drams) of charcoal added, and the oil filtered with suction.

A 15 per cent. solution of dichloramine-T in the chlorinated eucalyptol is made, and for use, some of the chlorinated liquid petrolatum further added. No more than an equal part of liquid petrolatum should be added when the solution is to be kept for any length of time, but when the mixture is to be used immediately, as much as 2 parts of liquid petrolatum to 1 of the 15 per cent. eucalyptol solution may be employed.

From his experience, J. E. Sweet (Jour. Amer. Med. Assoc., Sept. 29, 1917) states that his oily solution of **dichloramine-T** gives as good results in infected military wounds and has several advantages over older methods. Thirty-five c.c. (1⅙ ounces) sufficed to dress 42 wounds. Its use eliminates the Carrel tubes and reduces the frequency of dressings to once in 24 to 48 hours. It greatly reduces the amount of cotton and gauze required, as well as the soiling of bed linen.

ether in dressing of, iv. 641
ethyl aminobenzoate in, iv. 693
europhen in, iv. 708

Browning, Gulbransen, Kennaway, and Thornton (Brit. Med. Jour., Jan. 20, 1917) found a substance of the acridine group, **flavine** (dimethylaminoacridinium chloride), to possess extremely powerful bactericidal and antiseptic properties, which are enhanced rather than diminished by admixture with serum, differing in this respect from other powerful antiseptics. It is the most powerful bactericide of all those investigated for both Staphylococcus and B. coli, the enterococcus, and for anaërobes such as B. edematous maligni. It is much less detrimental to phagocytosis and the tissues than other substances. Clinical results substantiated the value of flavine and brilliant green. The duration of septic conditions is in general reduced by at least a half.

Ligat (Brit. Med. Jour., Jan. 20, 1917) used **flavine** compounds and **brilliant green** in upward of 150 cases, irrigating the wounds with a 1:1000 solution of the antiseptic in normal saline, and then covering them with gauze soaked in the solution.

formalin-gelatin powder in, iv. 736
hamamelis in, v. 161

In the seriously wounded, with marked loss of body heat, especially in the limbs, Feuillade and Blechmann (Paris méd., July 14, 1917) believe a **preliminary heating** before operation an important aid to recovery. They use the supplementary surgical cabins of the French army as heating rooms. With their radiators these can usually be heated to 36° C. The patients are also covered with blankets, with their legs in cotton and further heated by hot water-bottles. The benefit procured is striking.

Good results are reported by Bandaline and de Poliakoff (Presse méd., Sept. 24, 1917) from a jet of **hot air** in wounds refusing to heal promptly, including frostbite of the feet and torpid infectious processes in general. A germ count is made before and after the hot air douche to trace the progress.

hydrogen dioxide in, v. 574

O'Conor (Annals of Surg., Apr., 1917) emphasizes the good results obtained by treating desperate cases of infected railway wounds by 4-hourly irrigation with **hot peroxide solution** (2 ounces—60 c.c.—to the liter—quart) followed instantly by **hot phenol** lotion (½ ounce—15 c.c.—to the liter—quart), and the application of **hot perchloride of mercury** fomentations (wrung dry). A septic cavity or cavities should be converted into 1 large open sore. When feasible, submersion in warm **peroxide lotion** once or twice daily is a useful adjunct.

C. H. Gilmour (Can. Jour. Med. and Surg., Feb., 1917) has used preparations of **hypochlorous acid**, that prepared by Lorrain Smith, of Edinburgh, and the other by Cohen, of Leeds.

The Edinburgh preparation, also known as **eusol**, is made up as follows: To a liter (quart) of water 12.5 Gm. (3⅛ drams) of bleaching powder (chloride of lime) are added and shaken vigorously. Then 12.5 Gm. (3⅛ drams) of boric acid powder are added, and it is again thoroughly shaken. Upon standing over night and filtering it is ready for use. The solution contains hypochlorous acid 0.54 per cent., calcium biborate 1.28 per cent., and calcium chloride 0.17 per cent. It should be kept well corked in dark-colored bottles, and is effective for 1 month.

The other preparation, known as **chloramine**, is made up as follows: 140 Gm. (dry) (4⅔ ounces) of sodium carbonate, or 400 Gm. (13 ounces) of the crystallized salt, are dissolved in 10 liters (quarts) of tap-water, and 200 Gm. (6½ ounces) of chloride of lime are added. The mixture is well shaken, and after ½ hour the clear liquid is siphoned off and filtered through cotton. Boric acid, 40 Gm. (10 drams), is added to clear filtrate, and the solution is ready for use. It contains 0.5 to 0.6 per cent. hypochlorous acid and should not be kept longer than a week.

The author prefers the Edinburgh preparation because it is easily prepared at small cost, non-toxic, keeps the wounds bathed in lymph which contains antibodies, is practically painless, dissolves necrotic tissue, causes wounds to lose their fetid odor, and is hemostatic. It has been given intravenously in some cases.

infiltration anesthesia in, iii. 499
iodine tincture in, vi. 36, 37

Starch iodide is recommended by A. Lumière (Presse méd., Sept. 20, 1917) in wounds of soft parts due to abrasion, unassociated with sinuses or deep, inaccessible tracts. In deep wounds success was secured by irrigations of starch iodide after the Carrel method. The solution consists of soluble starch, 25 Gm. (4¼ drams); boiling water, 1 liter (quart), and 1: 1000 iodine-iodide solution, 50 c.c. (1⅔ ounces). This fluid contains iodine in extreme subdivision, and seems to possess antiseptic power of the same order as Dakin's solution. It is not irritating to the skin and has no deleterious action on clothing.

iodoform vapor in, vi. 53
kaolin in, vi. 175
lysol in, viii. 503
magnesium sulphate in, vi. 477
menthol-iodol in, vi. 650
mercury biniodide in, vi. 675
naphthalene in, vi. 786
olive oil in, vii. 171
oxygen-gas in, vii. 275
perhydrol in, v. 570
phenocoll in, vii. 438
phenol in, vii. 443

The use of **pure phenol** is advocated by Maylard (Brit. Med. Jour., June 16, 1917) for septic wounds with ill-defined and attached portions of septic and dead tissues. Such tissues cannot always be successfully removed surgically, being often difficult to recognize and define. The usual and newer antiseptics here do not penetrate sufficiently.

quinine lygosinate in, iii. 391
quinine sulphate in, iii. 390
silver-foil platelets in, viii. 137
silver nitrate in, viii. 136, 137
sodium chloride in, viii. 193
sodium citrate in, viii. 193

Vegetable tar poured over frostbitten feet, burns, and other torpid minor surgical processes is recommended by Pasquali (Policlinico, Feb. 11, 1917). If necessary, it is slightly heated to render it more fluid.

Vaccination against infection of wounds is advocated by Bielonovsky (Russky Vratch, xvi, No. 3, 1917), after noting a favorable effect in the wounded treated with injections of Wright's vaccine to protect against streptococcus infection.

Wright's solution in, viii. 193
zinc phenolsulphonate in, vii. 447
abdominal, i. 130

Wounds (*continued*).
  contused, **glyceritum boroglycerini** in, v. 30
    guaiacol in, v. 148
    iodine tincture in, vi. 36
    magnesium sulphate in, vi. 476, 477
  due to military firearms, i. 149

In war wounds Pisano (Policlinico, Apr. 22, 1917) advocates definite operation at once and deprecates the old way of first aid, then new examination and dressing by each surgeon through whose hands the wounded man passes in the clearing station, on the train, and in the base hospital.

The advisability of providing ample casualty clearing hospitals as near to the fighting line as military exigency allows is emphasized by Lieutenant-Colonel H. G. Barling, R.A.M.C. (N. Y. Med. Jour., Nov. 10, 1917). This insures a large proportion of the wounded receiving skilled surgical treatment within a few hours of their injury. Otherwise, the patients must be sent without operation to the base hospitals, and their wounds may not be efficiently treated for 24 to 48 hours or even later. By this time gross infection will have established itself in the surrounding tissues and its extirpation be either impossible or incomplete.

Primary closure of a wound must be done only with discretion, and avoided especially when there has been any interference with the arterial supply to the part. In wounds not suitable for closure, given a sufficiently large surgical and nursing staff, the writer would unhesitatingly adopt **Carrel's method** with **Dakin's solution.** This should only be done if the surgeon has well learned Carrel's technique. Failing these conditions, he thinks well of **Morison's iodoform preparation,** which must be applied in moderation to avoid iodoform poisoning. **Brilliant green** has not impressed him as an antiseptic. **Flavine** on paper is highly promising, but has yet to show its value in war wounds. **Salt solution** of varying strength and the **salt pack** have fallen into disuse, but may still be used with advantage in wounds surrounded with much induration.

Vincent (Presse méd., Mar. 29, 1917) urges the value of dusting war wounds thick with a dry powder consisting of **calcium hypochlorite** and **boric acid** in the proportion of 1:10. This prophylactic treatment, particularly useful when the wounded are coming in in large numbers, is renewed the next day, if there is delay in getting the wounded to the hospital. It has a powerful sterilizing action and seems to ward off gas gangrene.

G. Duchesne (Bull. de l'Acad. de méd., Apr. 3, 1917) in suppurating wounds recommends the following harmless antiseptic and healing dressing: **Camphor,** 5 Gm. (1¼ drams); **balsam of Peru,** 10 Gm. (2½ drams); **gomenol,** 25 Gm. (6¼ drams); **ether** and **liquid petrolatum** or **almond oil,** of each 500 c.c. (1 pint). This is highly diffusible, penetrating into all wound recesses, and prevents adhesions of dressings. Healing is distinctly accelerated.

Policard and Desplas (Presse méd., Mar. 5, 1917) state that microscopic foreign bodies are very frequently present in wounds in perfect condition. They do not prevent normal healing, but account for the "latent microbic phenomena" of scars, recently studied by Lecène and Frouin. Excising granulation tissue and spontaneously arising cicatrices is shown to be a rational procedure.

According to Gross and Tissier (Presse méd., July 19, 1917), before closing a wound one should know both the quantity and the kinds of bacteria present. When anaërobes and streptococci are both present, severe infection, in particular a gangrenous or gaseous infection, can be predicted, and the wound should be left freely open. In all other cases, closure of the wound will probably be soon possible or even mandatory. **Primary suture** is indicated where one completely excised contused and infected tissues and extracted the missile; **secondary suture,** where

these conditions have not been fulfilled or primary suture has been impracticable because of an excessive number of wounded, or for any other reason, preventing operation within 24 hours.

gangrenous, **hydrogen dioxide** in, v. 568
granulating, **silver foil** in, viii. 137
hemorrhages from small, **copper sulphate** in, iii. 645
incised, **ichthyol** in, v. 639
  light therapy in, vi. 363
  magnesium sulphate in, vi. 477
indolent, **iodine tincture** in, vi. 44
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infestation of, with fly-maggots, **turpentine injections** in, viii. 634
lacerated, **glyceritum boroglycerini** in, v. 30
  iodine tincture in, vi. 36
  light therapy in, vi. 363
  magnesium sulphate in, vi. 477
  potassium-mercuric iodide in, vii. 584
of arteries, viii. 800
of brain, gunshot, see Head and Brain, Gunshot Wounds of, v. 168; also this Index.
of conjunctiva, iii. 596
of ears, iv. 712
of head, gunshot, see Head and Brain, Gunshot Wounds of, v. 168; also this Index.
of heart, see Heart, Wounds of, iii. 133; also this Index.
of intestine, i. 60, 132, also this Index.
of lung, see Lung, Contusions and Wounds of, iii. 122; also this Index.
of muscles, vi. 766
of penis, vii. 339
of pleura, see Pleura, Contusions and Wounds of, iii. 122; also this Index.
of scalp, see Scalp, Wounds of, v. 163; also this Index.
  iodine tincture in, vi. 37
of tendons, viii. 507
of thoracic duct, see Thoracic Duct, Wounds of, iii. 130
of veins, viii. 800
of vessels, viii. 800
postoperative, **airol** in, i. 486
  europhen in, iv. 709
  ichthyol in, v. 639
punctured, **iodine tincture** in, vi. 37

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  local measures in, viii. 822
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    sodium hypochlorite solution in, viii. 193, 822, 823

According to Leriche (Presse méd., May 24, 1917), recent infected wounds with dead tissues excised, and opened out flat, can be sterilized by **sunlight** in 48 hours. The first period of insolation lasts ½ hour, and the second 2½ hours. After 6 days such a wound could be sutured with successful results. In deep wounds with irregular recesses and fractures the sterile condition was obtained in 4 to 6 days. Where the sunlight is rather subdued the wounds can be safely exposed for a long time; where bright and hot, small progressive doses are indicated, not exceeding 15 minutes on the first few days.

    Wright's lavage in, viii. 193, 823
  prophylaxis, viii. 814

In moderately infected wounds, carefully washed with sodium oleate and with but slight discharge, Carrel and Hartman (Jour. Exper. Med., July, 1917) found that a paste of **sodium stearate** and 4 to 15 parts in 1000 of **chloramine-T** will cause complete disappearance of bacteria and maintain sterility indefinitely. Cica-

trization is not hindered. This paste should *not* be used in severely infected wounds.
    Dakin's solution in, viii. 193
    Dakin-Carrel solution in, viii. 815
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Xeroform, ii. 466
Xerosis, see Asteatosis, ii. 221; also this Index.
Xerostomia, viii. 60
    pilocarpine in, viii. 60
Xerotic keratitis, iii. 653
X-rays, viii. 825

Bensaude and Terrey (Presse méd., Mar. 22, 1917) for X-ray examination of the digestive canal use finely pulverized barium sulphate in a 50 per cent. gelatinous vehicle. This forms a velvety cream without tendency to precipitation for several hours or days. See also Barium, this Index.

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